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Financial Development and Economic Growth: A Comparative Study of Multivariate Analysis of Kenya, South Africa and Zambia's Economies

A thesis submitted in fulfilment of the requirements for the award of degree
Doctor of Philosophy

To the

UNIVERSITY OF CAPE TOWN



**SCHOOL OF ECONOMICS
Faculty of Commerce**

By

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October 2007

Declaration

I Lufeyo Banda, declare that this thesis, submitted in fulfilment of the requirement for the award of Doctor of Philosophy in the School of Economics, University of Cape Town, is wholly my own original work unless otherwise referred or acknowledged. The thesis has not been submitted for qualification at any other academic institute. Furthermore, I wish to acknowledge that two chapters of this thesis have now been accepted for publication under the South African Journal of Economics and European Journal of Financial Economics. I have also been awarded the EHD Arndt medal for the best postgraduate conference paper by the Economic Society of South Africa.

Lufeyo Banda
October 2007

Acknowledgements

I am indebted and deeply grateful to my supervisor Professor Abraham Haim for his guidance and support. My thesis would have taken a different shape had he not shared his thoughtful and excellent comments and encouraged my research throughout my time at the University of Cape Town.

While working on the six core chapters of this thesis, I have benefited greatly from the advice and feedback of many others.

I wish to acknowledge Professor Johann, Fedderke; Professor Evance, Kalula; Professor Melvin, Ayogu; Mr. Erick, Isaac and Kularatne, Chandana for many helpful comments and suggestions. Appreciation is expressed to my colleagues at UCT and Wits for their support throughout these years. I am fortunate to have met excellent friends like Martin Phangaphanga, Miracle Ntuli and Ibrahim Kamara. Special thanks also go to my family for their support. I am grateful to the AERC for their financial support as without it this work would have never started.

Needless to say, any remaining errors are mine.

Abstract

There has been a renewed interest in the nature of the link between the development of the financial sector and economic growth. Many theoretical models have been proposed that show how financial sector development promotes growth. Empirically, financial development has been found to robustly and positively correlate with economic growth. However, establishing the direction of the relationship between finance and growth (causality), on the other hand, has been difficult. In the empirical results regarding Kenya, South Africa and Zambia not only was it found that the financial development and economic growth proxies are statistically significant but also found were the results which seem to lend support to un-directional and indirect hypotheses over the sample period 1965-2004.

To unearth the above long-run relationship a multivariate vector, autoregression (VAR) and the Toda-Yamamoto framework were applied. Difficulties relating to empirical investigations to do with cross-country regressions and bivariate time series studies are pointed out. The long-run relationship of financial development and economic growth in all the sampled countries are identified in a co-integrating framework using Pesaran, Shin and Smith (PSS) and Johansen tests. In particular, in using the Johansen technique this thesis identifies the long-run relationship by applying over-identifying restrictions. To unearth the direction of the relationship between finance and growth the Vector Error Correction model was applied and the results obtained appear to lend support to the supply-leading hypothesis in all the three countries, a conclusion which seems to support the findings in existing literature. The results also show the indirect causal relationship taking place between finance and growth in these countries. This finding seems to suggest the existence of financial repression in these economies. The robustness of VECM test results were supported by those of Toda-Yamamoto. Overall I ascribe these findings to new approaches to the analysis of the direction of the relationship (causality).

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Chapter 1

Background & Motivation of the Study

1.1 Introduction

It is generally recognised that financial development plays a significant role in economic growth. For instance, Hamilton (1781) argued that banks were the best piece of innovation that was invented for spurring economic growth. That is, there is a causation that runs from banking sector development to economic growth. This argument though old may be supported by the recent experience in Eastern Europe and Asia where it has been shown that countries that moved quickly to fix their banking industry were able to achieve a sustainable rate of growth and new job opportunities than those that did not.

An extensive body of empirical evidence supports the argument that a well-developed financial system has a positive impact on economic performance by enhancing intermediation efficiency. This finding presupposes that a well-coordinated financial intermediation influences the allocation of resources and productivity growth. On the other hand, financial development may enhance economic growth via capital accumulation, liquidity provision or technological changes.

The above link suggests that economic growth rarely (if ever) occurs without a well-functioning financial system (McKinnon, 1973; Shaw, 1973; King & Levine, 1993; Levine *et al.*, 2000; Beck *et al.*, 2000). In other words, extensive government controls imposed on the financial sector prevents financial development and impedes the contribution of the sector to economic growth.

It follows, then, that in terms of causality, efficient and sound (non-repressive) financial development leads to economic growth. Yet, despite its theoretical validity, such a view seems inconsistent with recent experiences. Specifically, the rapid growth of many Asian economies in the 1970s was accomplished despite the financial sectors that could not be regarded as developed (Shan *et al.*, 2001). With these contradictory signals with respect to the causal relation between finance and growth in empirical studies it is difficult to reconcile with the widespread view that financial development causes economic growth.

Whereas the finance-led growth hypothesis is not ruled out in recent studies on the finance-growth link in Kenya, South Africa and Zambia, the literature throws little light on how a reformed and developed financial system can generate less economic growth. Yet out of this hypothesis emerge three highly relevant questions: How can the apparent relationships involving the unearthing of the direction of causality between finance and growth be interpreted? Is financial development a prerequisite to economic growth in these three countries or the reverse? Why and how did the supposedly reformed financial system of the three countries accommodate economic growth?

The questions raised above have important policy implications. For instance, if financial development is found to cause economic growth, then policy-makers should focus their attention on the creation and promotion of modern financial institutions which includes banks in order to promote economic growth. Against this the thesis sheds light on the issue of causality by empirically examining the interactions between financial development and economic growth. The positive correlation between financial development and economic growth is already a stylized fact verified in many cross-country studies (King & Levine, 1993a, 1993b; Levine & Zervos, 1998).

However, findings on the causal relations and the contribution of the financial sector to (future) economic growth and vice versa are divergent. This view is supported by time series studies which report mixed results (Arestis & Demetriades, 1996; Demetriades & Hussain, 1996).

The motivation for this thesis is based on the argument put forth for lack of consistency in the time series studies and the fact that many of these studies are based on both bivariate and cross-country causality tests. And yet it is well known that both bivariate and cross-country tests suffer from omitted variable and homogeneity problems, and this leads to erroneous causal inferences (Lütkepohl, 1982; Jung, 1986). Time series studies are few and data seems to be a significant problem.

Thus, in order to examine the causal relationship between the variables of interest, this thesis employs a time series analysis using a multivariate vector autoregression (VAR) setting. The dimension of the VAR is specified following the standard theoretical literature which is discussed in Section 2. In a multivariate system of co-integrated variables, the framework of Johansen (1988) allows one to address the issue of long-run causality in a more formal and

complete way, i.e. without generalizing the results (Hall & Wickens, 1993; Hall & Milne, 1994)¹. Toda and Phillips (1993) recommend the Johansen framework as the best method of implementing Granger non-causality tests. Pesaran and Shin (1994) propose tests of just and over-identifying restrictions in order to identify co-integrating vectors as typical long-run economic relationships.

To test the hypotheses of the direction of causal relation between variables of interest, the study employs the recent advances in time-series econometrics (i.e. VECM and Toda-Yamamoto). First, co-integrating vectors are estimated making use of the method of Johansen (1988). This is followed by two types of identification of the model involving the just-identifying and over-identifying restrictions in order to test for the direction of causality as postulated by Hall and Wickens (1993) and Toda and Phillips (1993). With regard to the robustness check the augmented VAR modelling by Toda and Yamamoto (1995) is employed.

1.2 Objective of the Study

The overall rationale of this study is to determine whether the direction of causal relationship between financial development and economic growth exists on a country specific level involving Kenya, South Africa and Zambia and thereafter conduct a comparative analysis. The specific objectives of the study in this case are:

- To find out the role of regulation in so far as the development of financial sector system is concerned. This analysis is done via the review of the reforms of financial systems of individual countries.
- To use the co-integration framework of Johansen (1988) to test for multivariate co-integrating relationships. Additionally, the robustness test is applied using Toda-Yamamoto (1995) to ensure that Johansen tests do not suffer power loss due to finite samples.
- To test and distinguish between long-run and short-run causality. This distinction is very important since as Darrat (1999) states, most of the benefits of higher levels of financial development could be realized in the short-run while in the long-run as the

¹ This approach enables joint modelling of all relevant variables without a priori making assumptions about their exogeneity or endogeneity status, which is necessary in single equation approaches.

economy grows and becomes mature these effects slowly disappear. Thus, testing only for long-run causality would lead to the wrong conclusion, namely absence of any casual relationship between financial development and output growth. To this end, an error correction model (ECM) via which short-run causality is also tested.

- Draw appropriate policy recommendation that could help promote economic growth.

1.3 Main Contribution

The main contributions to the literature are as follows. First, there is a clear lack of multivariate time-series tests of causality between financial development and economic growth in many developing countries. This study fills this gap. In so doing it addresses the mis-specification problem inherent in the existing bivariate studies. Also addressed in this thesis is the concern raised about the cross-country results by providing evidence based on country specific multivariate time-series analysis. Second, the empirical statistics identify and report the long-run financial development and output vectors which reveal the strength of the relationship between financial intermediary development and its determinants, real income per capita income, investment, real interest rate, financial uncertainty and openness of the economy. Finally, the systems approach that eliminates the single equation and avoids the bias that may have affected the previous studies is applied in the analysis of data.

The results obtained in this study are thus distinct from others in that the uni-directional causality results were found to be more prevalent than bi-directional causality between financial development and economic growth. This finding is confirmed by the fact that bi-directional causality in the long-run is only confirmed in one out of the three sampled countries, namely Kenya. In the remaining two other countries (that is South Africa and Zambia) the findings seem to suggest a uni-direction causal relation running from finance to growth. This is attributed to: (i) analysis of a higher dimensional system which involves simultaneous equations as opposed to single equation approach, (ii) a new approach of restrictions to the identification of the co-integrating vectors (i.e. long-run relationships), and (iii) a new approach to long-run causality testing using error correction terms and Toda-Yamamoto level VAR approach.

1.4 Structure of the Thesis

This thesis is divided into six chapters. Chapter 1 is the introductory section. Chapter 2 presents a comprehensive survey of the literature on finance-growth nexus and their regulatory reforms. This survey forms the theoretical basis for the study on Kenya, South Africa and Zambia's cases. In this chapter, the relationship between finance and growth is analysed. Within the framework of finance and growth relationship the issue of causality is also examined.

Chapter 3 describes the reform process of the financial institutions which has taken place in all the three countries related to this study. In this chapter, an overview of economy for each individual country is presented, their financial systems before and after reforms are briefly discussed and the measures adopted under liberalisation are analysed.

Chapter 4 starts with the discussion of the theoretical framework applied in this thesis. This is followed by the discussion of unit root test. Furthermore, the chapter develops aggregated framework for the impact evaluation of financial development on growth and outlines the hypotheses of the study. The second model applied in this thesis is only used for identifying the variables to normalise on, while the last one is used for robustness checks of our VECM results.

Chapter 5 contains the empirical test results based on a country-by-country basis. The chapter starts with the discussion of unit root test on the time series of the variables used in the study. The unit root tests results which are obtained by employing the Augmented Dick Fuller approach are presented. Empirical results are also reported on a country-by-country basis. The co-integration and short and long-term dynamics of causality are presented and their results summarised. The long-run relationships detected by the co-integration test assess the impact of financial development on economic growth and vice versa. Similarly, the causality test results from the Toda-Yamamoto method shed light on the direction of causality between variables of interest in long-term dynamics only.

Finally, chapter 6 presents the conclusions and policy implications of the findings.

Chapter 2

Literature Review

2.1 Introduction

As with most disciplines at the frontier of research, the finance-growth nexus divides economists into a number of camps. Some dismiss such research as being unnecessary given the potential to over-stress the causal influence of finance on growth, others dismiss it in the belief that the proposition is too obvious to be worth serious investigation. A middle-ground is also found: support for the assertion that an underdeveloped economy can only enter a period of sustained economic growth if it also has suitable financial institutions, has been a recurring theme. Furthermore, there exist further arguments for causality in one direction, from financial depth to economic growth or from growth to finance, or in both directions.

Much of the argument to date has concentrated on an empirical analysis of economic history, the use of large datasets or broad cross-country data to establish a correlation between financial structure (i.e., the development of stock markets, banking systems and their regulation) and economic growth. Evidence from recent empirical studies suggests that deeper, broader, and better functioning financial markets can stimulate higher economic growth (Levine, Loayza & Beck, 2000; Beck, Levine, & Loayza, 1999; King & Levine, 1993a, 1993b). Although evidence on Africa is still limited, the results from existing empirical work supports the view that financial development has a positive effect on economic growth in African countries (Ndikumana, 2000; Allen & Ndikumana, 2000; Gelbard & Leite, 1999; Odedokun, 1996; Spears, 1992). The discussion of strategies for enhancing African economic development must therefore take into account the role of the financial sector in economic development.

2.2 Finance-Growth Nexus in Sub-Saharan Africa countries

During the last decades, the economic performance of sub-Saharan Africa (SSA) has been distinctly worse than that of other developing world regions. Between 1960 and 1980, the average annual per capita income growth in the region was 1.3%, compared to 2.5% worldwide. Between 1980 and 2000, SSA countries even experienced a decline in annual growth rates of about -0.6% on average, where the world grew at an annual rate of 2.7%.

Sachs and Warner (1997) attribute the region's poor economic performance to geographical factors such as climate or access to seas as well as to inappropriate economic policies. In particular, they argue that the region's lack of openness to international trade has been a major obstacle to better performance, a factor that almost naturally coincides with low levels of trade liberalization in SSA.

Collier and Gunning (1999) similarly suggest that geographical disadvantages have negatively affected economic growth. They also argue that poor economic policies have impaired growth more markedly. For instance, they suggest that the lack of trade openness, poor infrastructure and public services, and the underdevelopment and closeness of both financial and product markets are among the factors that have had growth-reducing effects.

Financial systems in SSA can generally be described as underdeveloped. As summarised by Gelbard and Leite (1999) and Ncube (2007), regional financial sectors suffer from various unfavourable characteristics. These characteristics include limited financial products and financial innovation, wide interest rate spreads, weak legal systems, poor institutional environments and pronounced market fragmentation. The level of financial depth and financial efficiency in the region is rather low, also in comparison to other developing world regions. Financial systems in SSA are strongly bank-based, whereas stock markets are generally not well-developed.

2.2.1 Trends and Patterns of Finance & Growth of African Countries

In the case of African countries, recent surveys, especially those by Mehran *et al.* (1998) and Gelbard and Leite (1999) have made a significant contribution to this area. Based on results from a survey of 38 sub-Saharan African countries in 1997, Gelbard and Leite compiled indicators on six major aspects of financial development: (1) the market structure and competitiveness of the financial system; (2) the range of financial products available on the market; (3) the degree of financial liberalisation; (4) the institutional environment under which the financial system operates; (5) the degree of integration with foreign financial markets (financial openness); and (6) the degree of sophistication of monetary policy instruments. Gelbard and Leite computed indices that summarise the level of development of a country for each of the six aspects as well as a composite index that measures the overall

level financial development in 1987 and 1997.² Countries were then classified as undeveloped, minimally developed, somewhat developed, or largely developed. The indicators compiled by Gelbard and Leite are highly informative not only on cross-country variations in the overall level of financial development, but also on differences in certain features of the institutional environment that are relevant for financial development. The findings from these surveys are summarised in section 3.4 below.

2.2.2 Financial Development: Trends and Patterns in SSA

In this section, we present some stylised facts on economic performance and overall financial development using aggregate statistics based primarily on the World Bank's *World Development Indicators*. As can be seen from Table 1, average real income, investment, and saving have declined in the 1990s compared to the 1980s (Collier and Gunning, 1999a, 1999b). In the sub-Saharan African sample, average real income, investment, and saving have declined systematically in every decade since the 1970s.

Table 1: Some indicators of economic performance for sub-Saharan Africa

Period	Real GDP per capita (US\$)	Gross Fixed Capital Formation (% GDP)	Gross Domestic Savings (% GDP)
1970-1979	579.8	24.6	23.0
1980-1989	555.6	18.0	20.1
1990-1999	504.6	17.2	15.3
2000-2004	511.2	17.0	15.8
Average Annual % changes			
1970s to 80s	-0.4	-3.7	-1.4
1980s to 90s	-1.0	-0.5	-3.1
1990s to 2000s	0.1	-0.1	0.3

Source: WDI online data

According to these statistics, only 12 of the 42 countries experienced an increase in real income from the 1970s to the 1990s. For as many as 16 countries in the sample, per capita real income in the 1990s was lower than in the 1970s. These statistics illustrate what some researchers have referred to as 'growth tragedy' or 'development disasters' (Easterly & Levine, 1998; Chari, Kehoe, & McGrattan, 1997). While the continent includes success stories like Botswana, Mauritius, and Seychelles, whose income levels are high and rising, it also includes a number of disappointing cases. Even countries with vast resources like the Democratic Republic of Congo (former Zaire) and Nigeria have been unable to meet

² The study by Gelbard and Leite covered only 1997, while the information for 1987 was compiled retrospectively by the authors.

expectations due to many factors, including poor macroeconomic management and political corruption. Since the 1980s, aggregate indicators of financial development have either stagnated or declined on average in sub-Saharan Africa Table 2.

Table 2: Some indicators of financial development for sub-Saharan Africa

Period	Liquid Liability	Private Credit	Bank Credit
1970-1979	42.6(19.5)	42.9(14.3)	59.1(20.5)
1980-1989	40.9(24.2)	46.6(18.3)	64.3(32.1)
1990-1999	38.1(22.5)	64.5(14.6)	80.7(26.4)
Average Annual % changes			
1970s to 80s	-0.4(2.2)	0.8(2.5)	0.8(4.6)
1980s to 90s	-1.7(-0.7)	3.3(-2.2)	2.3(-1.9)

Source: WDI online data

Figures in brackets exclude South Africa and the North African countries

For sub-Saharan Africa, excluding South Africa, the average size of the financial system as measured by total liquid liabilities and credit supply were lower in the 1990s compared to the 1980s. If South Africa or North African countries (Egypt, Morocco and Tunisia) are included, the statistics show an increase in the volume of credit supply from the 1970s to the 1990s. The data also highlight the predominant size of the South African financial system. The average bank credit to GDP ratio for the sub-Saharan African sample in 1990-98 is 81 percent when South Africa is included, but only 26 percent when it is excluded. It is primarily through the supply of credit that financial intermediation stimulates real economic activity. Therefore the decline in credit supply in SSA may be a factor for the poor economic performance of the subcontinent over the past two decades.

The aggregate indicators of financial development hide wide disparities across countries. As a result there is a large gap between countries with sizeable financial systems, with liquid liabilities of over 40 percent of GDP, and countries with much smaller financial systems. The countries with relatively large financial systems include North African countries (Algeria, Egypt, Morocco, and Tunisia) and some sub-Saharan African countries such as Kenya and South Africa. These countries also have high ratios of credit supply to GDP, and most of them have experienced an increase in credit supply while credit supply declined in the majority of other sub-Saharan African countries over the 1970-1999 period.

However, since the mid-1980s progress has been made with regard to financial liberalisation in many African countries, leading to a reduction of entry barriers for foreign institutions.

The reforms positively contributed to additional inflows and caused greater diversification of risk through risk sharing with foreign investors. In addition, financial development in the form of portfolio diversification, consumption smoothening and insurance helped to facilitate the management of risk. Further, interest rates were liberalised and quantitative restrictions removed. The reform process also pushed forward the privatisation of state institutions and promoted the independence of central banks. Most importantly, reforms included the provisions in prudential regulations for guidance on risk appetite (Kasekende, 2008).

Table 3 shows that since 1990s the financial sector in Africa has been strengthened, captured in part by the increase in bank deposits relative to GDP in both low and middle-income African countries.

Table 3: Indicators of financial development by income group in sub-Saharan Africa

	Sub-Saharan Africa				Others	
	Low-income		Mid-income		Mid-income	
	1990-99	2000-04	1990-99	2000-04	1990-99	2000-04
Bank deposit to GDP	13.6	18.0	44.5 (29.7)	50.7 (29.2)	31.7	39.4
Private sector credit to GDP	12.3	13.3	52.1(21.5)	64.0 (21.0)	39.4	40.3
M2 to GDP	21.9	29.6	49.8 (35.0)	55.6 (32.1)	77.3	94.2
Liquidity liability to GDP	19.1	23.8	47.9 (34.5)	53.4 (32.5)	36.6	41.2

Source: IMF, International Financial Statistics

Figures in brackets represent Mid-income countries minus RSA

Similarly, money (i.e. M2 and liquid liabilities) has risen amounting to more than 50 percent of GDP in the middle-income countries in the 2000-04 period. With regard to private sector credit, slight positive trends can be observed in the low-income region while middle-income countries have experienced a significant increase in private sector credits. Once again, it has to be noted that the positive developments in the middle-income countries are driven largely by the changes in South Africa which accounts for more than half of the total output contribution. The evolution in middle-income sub-Saharan Africa countries without South Africa has been rather negative particularly with regard to quasi-money relative to GDP, which declined by almost 3 percent.

2.2.3 Stock Market Development

With banking dominant, the remainder of the formal financial system controls far smaller resources. This again is characteristic of low-income countries in general and not specific to Africa. But there is some variation among African countries revealing the potential for improvements in those that lag behind.

Non-bank finance can offer a range and variety of services that is not part of the standard product range of banks. Furthermore, a strong non-bank sector can also provide competition for the banks. Financial systems in the advanced market economies are characterised by a very diverse array of institutions and markets offering a variety of products. Apart from banks, this includes capital markets, with both equity and debt securities and contractual savings institutions, such as insurance companies, pension funds and mutual funds. This wider range of institutional specialisations has the potential to offer a wider range of financial services and better risk-pooling at keener prices in a more competitive environment than is characteristic of the bank-dominated systems that are observed in most of Africa and in most low- and lower middle-income countries across the globe. In particular, contractual savings institutions can be major forces in providing patient capital, equity or loans, for long-term projects. Organised securities markets help to improve the transparency of funding arrangements by determining the market-clearing price of equities, as well as market-clearing interest rates for bonds. Equity markets are particularly valuable in providing financing to risky ventures about which there may be wide differences of opinion. Banks are often reluctant to finance these because the downside risk is insufficiently compensated by the contractual interest rate; well-resourced investors can build a portfolio of equity claims on such ventures for which the securities market will provide an exit mechanism in due course for those that are successful.

2.2.3.1 Securities Markets

With a market capitalisation of USD 600 billion, the South African (Johannesburg) market is the fourth largest emerging market in the World (after Korea, Russia and India). Yet even Johannesburg is not a big enough market to retain the primary listings of several of South Africa's largest companies. Altogether, 21 of the companies listed in Johannesburg have their primary listings elsewhere; including the mining conglomerate Anglo American, the banking group Investec, the brewing company SAB-Miller, the insurance giant Old Mutual and the technology company Dimension Data, all have their primary listings in London. This shows

that the context in which African securities markets are operating is one in which the larger companies will be looking abroad as well as to the home market.

There are 15 organised securities markets in Africa. Several other projects are under discussion, or partly implemented, but without any activity so far. (This does not count Cameroon and Gabon, both of which recently established stock exchanges but have not attracted any listings yet.) One exchange, the BRVM headquartered in Abidjan, caters to the eight-country UEMOA zone, having been expanded from the Abidjan stock exchange created in 1976. Four other exchanges were started in the days of the British Empire, those with headquarters at Nairobi, Lagos, Harare and Johannesburg, the latter two having histories going back into the 19th Century. The older exchanges also have the largest number of equities listed. These five, along with those established in 1988-9 in Botswana, Ghana and Mauritius are the only exchanges with market capitalisation at end of 2004 in excess of 10 per cent of GDP, even though market capitalisation has been increasing in recent years.

Trading data shows a different aspect of the contribution of stock exchanges in developing countries. It is influenced by secondary market liquidity and also by the degree to which a large fraction of the shares in developing markets are effectively locked-up in the strategic stakes of controlling shareholders and are not normally available for trading. It should be noted in this context that funds actually raised on these as on most capital markets are but a tiny fraction of market capitalisation. The eight oldest exchanges also have the most trading, with value traded fluctuating around 2 per cent of GDP for the past several years (see Table 8). Even these more active African exchanges (Johannesburg aside) cannot be considered to have much trading. Except for Johannesburg, turnover on all markets is less than 15 percent of market capitalisation. There was no trading on the Maputo exchange in 2004.

Low turnover is reflected in, and feeds back into, a lack of liquidity as illustrated by large gaps between buy and sell orders, and high price volatility. This lack of transaction is also somewhat reinforcing, as the transaction volume does not justify investment in technology either by the exchange itself or member brokers. Limited trading discourages listing and raising money on the exchanges. Even linking different centres electronically (as for example in the BRVM, or with the case of Namibia whose stock exchange is now electronically linked to the JSE) cannot guarantee much more trading and liquidity.

In international comparison of composite indicators of equity market development on the available data, typically only for 7 or 8 of the African exchanges that the main African exchanges fall behind the developing country average mainly in regard to efficiency, as distinct from size, stability and access (of issuers these concepts are spelled out in World Bank, 2006).

The other seven markets, all established since 1989, are small on all measures. The smaller African countries tend to have neither organised exchanges nor any prospect of one. This may change in the future as more emphasis is placed on markets driving the economies in LDCs. Furthermore, these stock markets are characterised by high diversity in terms of age, size and, and performance. The region also counts both for long-established stock markets (South Africa and Zimbabwe) dating as far back as 1880s as the more recent ones (see Table 4 below).

Table 4: Indicator of stock market development in Africa, 2004

	Number of listed firms	Market cap % of GDP	Value traded % of GDP	Turnover %	Concen- tration of firms	Year established
Botswana	18	29.4	0.6	2.1	0.21	1989
Cote d'Ivoire	39	13.6	0.3	2.5	0.21	1976
Ghana	29	30.7	0.8	3.2	0.12	1989
Kenya	47	24.9	2.1	8.0	0.20	1954
Malawi	8	9.0	1.0	11.1	-	1996
Mauritius	41	39.3	1.6	4.4	0.12	1988
Namibia	13	8.1	0.3	4.7	0.39	1999
Nigeria	207	20.1	2.3	13.9	0.08	1992
South Africa	403	214.1	76.5	45.0	0.06	1887
Swaziland	6	9.3	0.0	00	-	1960
Tanzania	6	6.2	0.2	2.5	-	1990
Uganda	5	1.4	0.0	0.2	-	1998
Zambia	11	8.0	0.1	1.1	-	1998
Zimbabwe	79	87.9	14.0	3.9	0.08	1896

Source: Financial Structure Database; World Bank Financial Sector Development Indicators

The small size and illiquidity of Africa's stock exchanges partly reflects low levels of economic activity, making it hard to reach a minimum efficient size or critical mass, and partly also the state of company accounts and their reliability. Several of the exchanges established in the late 1980s and 1990s were set up mainly in order to facilitate privatisation, and in the hope of attracting inward investment with the modernisation and technology transfer that they could convey (Moss, 2003). For example, the stock exchange in Maputo

was established in the process of privatising Mozambique's national brewery, which is still the only listed company and which has to bear the operating costs of the stock exchange. To the extent that their establishment was driven by outside influences rather than emerging from a realistic need felt in the market, whether by investors or issuers it is perhaps unsurprising that many have so far struggled to reach an effective scale and activity level.

Despite the problems of small size and low liquidity, African stock markets continue to perform remarkably well in terms of return on investment. The Ghana Stock Exchange was ranked as one of the world's best-performing markets at the end of 2004 with a year return of 144 percent in US dollar terms compared with 30 percent return by Morgan Stanley Capital International Global Index (Databank Group, 2004). Within the sub-Saharan Africa five other stock markets (i.e. Uganda, Kenya, Egypt, Mauritius and Nigeria apart from Ghana) were amongst the best performers in the year.

2.2.4 Structural & Institutional Indicators of Financial Development

From the surveys by Mehran *et al.* (1998) and Gelbard and Leite (1999), we can draw the following stylised facts about the development of financial markets in African countries over the past two decades.

2.2.4.1 Overall development

The structural and institutional indicators illustrate the cross-country diversity in financial development as pointed out earlier using aggregate measures. The structural and institutional indicators paint an encouraging picture (than aggregate indicators) for the overall financial development in the continent. Based on Gelbard and Leite's overall financial development index, the number of countries in their sample that were classified as somewhat or largely developed financially grew from two (Mauritius and South Africa) in 1987 to 27 in 1997 (see Table 5 below).

According to Gelbard and Leite, the countries with the most developed financial system in 1997 were Ghana, Kenya, Mauritius, Namibia, South Africa, and Zambia. However, measures of credit supply have deteriorated in some countries that are classified as largely developed or somewhat developed. This is the case for Zambia (largely developed), Nigeria, Malawi, and others (see Table 5). It is important to note that the rankings in Gelbard and Leite (1999) are relative to other African countries; so they should not be interpreted as indicators of financial development from a worldwide perspective. Egypt, Morocco and

South Africa, which are classified among ‘emerging markets’ can be considered as relatively developed from an international standard.

Table 5: Financial development indicators for African countries

Country	Overall Development		Liquidity Development		Credit to Private Sector (% GDP)		Credit by banks (% GDP)	
	1987	1997	1980-89	1990-98	1980-89	1990-98	1980-89	1990-98
Benin	Midev	Sodev	22.3	26.5	27.7	11.0	27.4	12.0
Botswana	Midev	Sodev	24.7	23.2	9.7	11.9	12.2	13.0
Burkina Faso	Midev	Sodev	16.8	22.6	15.5	11.3	13.4	10.2
Cameroon	Midev	Sodev	21.7	17.6	27.1	13.5	25.4	23.7
CARS	Midev	Midev	17.9	18.6	10.3	4.8	17.8	12.5
Congo DRC	Midev	Midev	14.9	15.0	2.2	1.1	9.2	13.2
Congo Rep	Undev	Sodev	17.4	17.4	20.0	10.8	25.3	22.1
Cote d'Ivoire	Midev	Sodev	28.6	27.9	38.1	25.8	44.9	36.3
Gabon	Midev	Sodev	19.9	16.1	19.2	9.9	23.5	19.2
Gambia	Midev	Sodev	24.5	24.9	19.3	10.5	41.8	6.8
Ghana	Midev	Sodev	14.8	17.1	2.8	5.8	21.0	22.7
Kenya	Midev	Ladev	29.0	39.3	30.1	33.1	47.4	52.9
Lesotho	Undev	Midev	49.9	37.8	12.2	19.0	28.8	23.9
Madagascar	Midev	Sodev	17.0	20.3	18.5	13.7	39.6	23.0
Malawi	Undev	Midev	21.9	19.4	13.1	8.3	33.6	16.2
Mali	Midev	Sodev	20.1	22.3	17.1	12.5	27.5	12.4
Mauritius	Sodev	Ladev	49.2	72.9	25.9	43.9	55.3	61.1
Mozambique	Undev	Sodev	41.7	26.0	37.2	13.9	51.9	6.7
Niger	Midev	Sodev	16.3	14.9	16.4	7.8	18.5	11.9
Nigeria	Midev	Sodev	29.4	18.3	15.4	8.6	37.7	21.2
Rwanda	Midev	Sodev	14.3	15.9	7.2	7.3	9.4	15.5
Senegal	Midev	Sodev	27.1	23.0	36.1	21.1	46.9	27.8
Seychelles	Midev	Sodev	31.3	52.5	12.7	14.9	35.6	73.2
Sierra Leone	Midev	Sodev	18.5	12.2	4.4	3.0	30.9	42.9
South Africa	Ladev	Ladev	54.2	51.9	68.8	108.2	89.8	128.1
Sudan	Midev	Sodev	28.3	16.1	10.8	3.6	32.0	13.8
Swaziland	Midev	Sodev	31.6	30.0	20.6	21.7	16.1	4.7
Togo	Midev	Midev	39.5	29.5	24.3	21.7	26.2	23.8
Uganda	Midev	Sodev	12.1	10.3	3.3	4.3	23.2	8.5
Zambia	Midev	Ladev	31.7	17.8	14.8	7.5	63.2	58.8
Zimbabwe	Midev	Sodev	24.6	23.5	20.0	31.0	42.7	49.4

Source: Gelbard and Leite (1999)

Key: under developed (Undev), minimally developed (Midev),
Somewhat developed (Sodev), largely developed (Ladev)

2.2.4.2 Market structure

Ownership in the banking industry has evolved significantly from a predominantly state-controlled to a more privately owned system. In 1997, 13 out of the 38 countries in Gelbard and Leite's sample had almost complete private ownership of banks. Banks were

predominantly state-owned in 10 countries in the sample, where the state accounted for at least 30 percent of bank loans and deposits. The banking system is still highly concentrated in the majority of sub-Saharan African countries as indicated by the conventional Herfindahl index and the interest rate spread in the Gelbard-Leite (1999) study.

The performance of the banking system has improved in some countries, but it is still low in the majority of them. High proportions of non-performing loans illustrate the inefficiencies in the credit allocation process and in loan repayment enforcement mechanisms. The average share of non-performing loans for the 38 countries in Gelbard-Leite's sample was over 20 percent in 1997. Low loan repayment rates (high default rates) constitute an important handicap for the stability of the banking system and it has adverse effects on the real sector. In particular, high default rates discourage lending, thereby reducing the overall supply of credit, which depresses private investment.

With the exception of South Africa, African financial systems offer a limited range of financial products. Gelbard and Leite (1999) find that bank lending is predominantly short term, government securities tend to have short maturities (less than a year in 23 countries in 1997), banks in many countries still don't issue credit cards (issued in only 15 countries in 1997), and inter-bank lending is still underdeveloped (inexistent in 8 countries in the sample in 1997).

The institutional environment is still deficient in many countries. One of the studies to investigate this is that of Mehran *et al.* (1998). They study the supervisory framework of (banking law and central bank autonomy), prudential regulation (bank capital ratios), the safety net (availability of deposit insurance), and the legal infrastructure. Their results show that some of the basic requirements for effective banking regulation and supervision are still inexistent in many countries. For example, many countries have no provisions for deposit insurance and the legal infrastructure for the protection of bank performance is weak or inexistent in many countries.

The Gelbard-Leite (1999) study paints a brighter picture. According to the Gelbard-Leite indexes, in 1997 the institutional environment could be considered as reasonably supportive for financial intermediation in 23 countries, up from just 8 countries in 1987. The institutional environment index includes indicators of specific features of the legal system and the regulatory framework that facilitate financial intermediation. These features include the

existence of property and creditors' rights and the ability of the judicial system to enforce such rights.

Empirical studies have established a positive connection between financial development and the quality of the legal environment (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998, 1997; Levine, 1998). The two aspects of the legal system that are most critical for financial intermediation are the quality of laws and the effectiveness of enforcement of these laws. So far with respect to the three study countries, only the South African system seems to have made a lot of headway with the quality and enforcement of these laws. For instance, the South African system has special courts through which the financial sector system can get help, while in the case of Kenya and Zambia, they still use the normal court system which is tedious and slow most of the time.

These two aspects must exist simultaneously. The quality of a legal system determines the rights of creditors pertaining especially to the respect for the security of loans and the ability to repossess the assets of defaulting borrowers. To encourage lending, these legal rights must be both clearly defined and effectively enforced. Enforcement of the rights of creditors requires a judiciary that maintains the rule of law, low corruption, and low risk of expropriation or contract repudiation.

While visible progress has been achieved over the past years, there are important institutional constraints to financial intermediation that African countries need to address. For example, the Gelbard-Leite survey reports that in 1997 the loan recovery process was difficult in as many as 28 sub-Saharan countries, commercial legislation was inadequate in 14 countries, and there was no legislation of the use of checks in as many as 11 countries in the sample.

2.2.5 Selected Issues in Finance-Growth Policy

This section identifies and briefly discusses some important topics related to financial development and the role of financial markets in economic development. The list is by no means exhaustive nor is the discussion in any way comprehensive and it includes the issues of financial reforms in less developing countries and financial sector structure (i.e. Markets vs. banks). The last issue investigates whether financial markets matter in the case of African countries.

2.2.5.1 Financial Repression

In the early post-independence era, African governments sought to use financial development as a tool of speeding up economic growth. Governments became the main players in the creation of new financial intermediaries, including development banks and commercial banks as well as in the nationalisation of commercial banks. Policy makers adopted the view that it was possible to foster economic growth by identifying growth promoting sectors and providing subsidised credit to promote those sectors. Governments also controlled interest rates, which, in the context of high and volatile inflation, often resulted in negative real interest rates.

By the 1980s, the financial sector was experiencing the same problems of mismanagement and inefficient allocation of resources that plagued the public sector in the majority of African countries. The financial system was characterised by pervasive default on loans, especially by state-owned enterprises, which accounted for a large share of the domestic credit supply. This weakened financial intermediaries, forcing governments to inject more resources in the system in the form of subsidies to keep ailing institutions afloat.

The disappointing experience of government-sponsored financial development forced countries to revise their strategies. Even though the government's presence is still significant in many countries, there is a visible trend towards more private ownership of banks. As part of the financial sector reform programmes initiated in the 1980s and accelerated in the 1990s, state-owned financial institutions have been privatised or restructured to reduce the share of the government in the ownership structure, and the creation of new private banks has accelerated due to the easing of licensing requirements.

One undesirable effect of liberalisation in some countries has been the proliferation of small undercapitalised institutions (World Bank 2000b). Moreover, the expansion of private sector participation has not resulted in a systematic increase in competition in the banking sector. Banking systems in many countries are still characterised by a high degree of concentration just as the case is in South Africa and Zambia. In these two countries at least four major banks account for more than 60 percent of the business in terms of asset and liability portfolios to both the public as well as the private sector. The system in Kenya seems to have done better with respect to bank concentration. The main drivers for this were the NBFIs and the support the government gave to local banks.

The government can foster financial development by pursuing sound macroeconomic management, especially fiscal discipline to improve macroeconomic stability, which minimises macroeconomic uncertainty. African countries have systematically suffered from bad fiscal policies that have exacerbated the effects of external shocks, resulting in high chronic fiscal deficits. At reasonable levels, fiscal deficits have minimal adverse effects on the financial system. But when fiscal deficits are chronically high, this increases the likelihood of monetary financing of the deficits and also forces the government to compete with private sector in the credit market.

There is evidence that some African countries that have made significant progress in macroeconomic and financial sector reform also have experienced improvement in economic performance and that their financial systems are improving. Uganda is often cited as an example of recent success in economic reform (see, among others, Kasekende and Hussain, 2000). The Ugandan government as well as its Reserve Bank has progressively established a good record of credibility in policy decision making, which has promoted an environment that is conducive to private investment and growth.

The government also can enhance financial development by promoting a strong, independent, and effective legal system. The judiciary plays an important role in enforcing the constitutional protection of individual and property rights, and by adjudicating commercial disputes. The benefits of an efficient judiciary include the predictability of the legal environment and the protection of investors against policy reversals. The predictability of commercial law reduces the risk associated with saving and other forward-oriented transactions both in the real sector and in the financial system. As a result, this facilitates the maturity transformation role of financial intermediaries as well as portfolio management by savers.

Legal systems in many African countries do not adequately fulfil their role of facilitating and enforcing the rules of economic exchange. Legal procedures often are excessively long, which imposes costly delays on economic actors (Widner, 2000). The lack of autonomy of the judiciary from the executive branch and from political and business interest groups results in lack of impartiality in the handling of commercial disputes. There are wide variations across African countries in the quality of law and the effectiveness of the legal system in facilitating economic exchange. There are no studies on Africa that have linked these cross-country variations in the legal system to differences in financial development. It would be

worthwhile to investigate whether the results from the existing cross-country studies that suggest that enforcement of investor rights and financial market development vary depending on a country's legal origin (as suggested by La Porta *et al.* 1997, 1998 and Levine, 1998) hold in the case of African countries.

2.2.6 African Experience

This section of the literature consists of efforts to assess the experience of African countries' growth with respect to their financial sector development. To show the trend of literature the rest of this section is organised along three lines. The first section reviews studies which have investigated the relationship between finance and growth based on a number of countries. The second section discusses studies on a country specific basis and last but not least we look at those studies which have investigated the effects of financial liberalisation and their effects on economic growth.

2.2.6.1 Cross-country cases on Finance-growth nexus

Bhatia and Khatkhate (1975) used correlation graphs to examine the relationship between economic growth and financial intermediation for eleven African countries. Financial intermediation is measured by the ratio of currency, demand deposits, and time and savings deposits to GDP. The authors find no definite relationship between growth and financial intermediation for the countries either individually, or for the whole group. Splitting the financial intermediation measure into two the ratio of money to GDP and the ratio of quasi-money to GDP still does not reveal any definite relationship between growth and financial intermediation.

Ogun (1986) used cross-section analysis to estimate the correlation between financial deepening and economic growth by using data for 20 countries in Africa from 1969 - 1983. The degree of financial intermediation is measured using the ratios of monetary liabilities (M1, M2, and M3) to GDP. For the full sample, all the monetary liabilities are negative and only the ratio of M3 to GDP is statistically significant. When the countries are split into high and low-income countries, some of the coefficients of the monetary liabilities are positive while some are negative. However, they are all insignificant and offer no support to the growth enhancing capabilities of financial intermediation.

Spears (1991) studied the causal relationship between financial intermediation and economic growth in a sample of five SSA countries, (Burkina Faso, Cameroon, Ivory Coast, Kenya,

and Malawi), where a strong link between the development of the financial sector and economic growth. The concept of causality used in this study is that of Granger (Econometrica, 1969) and the test involves two distributed-lag regressions: (1) (Mathematical Expressions Omitted) and (2) (Mathematical Expression Omitted) where (GDP/POP) is real gross domestic product per capita, (FI) represents a financial intermediation indicator, and m represents the number of lags applied to both variables. Two measures of financial intermediation were used, M2/GDP and Quasi-money/M2. With respect to the latter, there was no indication of causality in either direction in any of the five countries, with the exception of Burkina Faso. The F-test, however, indicates that financial intermediation as measured by M2/GDP causes economic growth, as measured by real gross domestic product per capita, in all five countries. The results lend support to the view that in the early stages of development, financial intermediation plays a supply-leading role and induces some measure of economic growth in the sample of SSA countries surveyed.

Furthermore, Allen *et al.* (1998) made an attempt to examine the role of financial intermediation in the economic union of Southern Africa called SACU by using four indicators of financial intermediation and three different panel techniques-simple OLS regressions, regressions including country-specific fixed effects, and regressions including a high-income dummy. In their empirical regressions, they found a positive correlation between financial development and the growth of real per capita GDP for the Southern Africa Development Community (SADC). However, their study suffers from two major weaknesses as far as the question of the relevance of domestic financial intermediation is concerned. First, it fails to take into consideration the heterogeneous nature of the economies concerned. Second, other studies have shown that the degree of financial and monetary integration among the SADC countries is still very weak (See for instance, Jenkins and Thomas, 1998: 153-156; and ADB, 2000: 152-154). By contrast, it has been shown that the financial sector in the Southern African Customs Union (SACU) countries are highly integrated because of the monetary union among most member countries.

Ndikumana (2000) studied the effects of financial development on domestic investment in a sample of 30 sub-Saharan African countries. The empirical investigation employed is based on a dynamic serial-correlation investment model that includes various indicators of financial development, controlling for country-specific fixed effects and nonfinancial factors of investment. The results indicate a positive relationship between domestic investment (total

investment and private investment) and various indicators of financial development. Higher financial development leads to higher future levels of investment, implying a potent long-run effect of financial development on domestic investment. The findings imply that financial development can stimulate economic growth through capital accumulation.

Following Ndikumana's (2000) method of panel data analysis, Allen *et al.* (2000) used various indicators of financial development to investigate the role of financial intermediation in stimulating economic growth in Southern Africa. The results lend some support to the hypothesis that financial development is positively correlated with the growth rate of real per capita GDP. This relationship is more evident in regressions that use pooled data (5-year cross-sections) than those using annual data. According to the two authors their finding seems to suggest that the finance-growth nexus is a long-run phenomenon. The data indicate that while Botswana, Mauritius and South Africa are making progress towards a high-income steady state, the rest of the countries in sub-Saharan countries are stagnating to low income levels and low growth rates.

Atindehon *et al.* (2001), extends the study on causality issue to another sub region of Africa called Economic Community of West African States (ECOWAS) and found a weak causal relationship existing between financial development and economic growth in almost all the countries included in their panel. The results show that economic growth causes economic growth in the following countries: Burkina Faso, Mauritania, Niger, Nigeria, Sierra Leone and Togo. In contrast, they also found that financial development seems to have led to economic growth in Ivory Coast, Mali, Gambia, Mauritania and Sierra Leone. Most importantly, the study found that the credit allotted by the banks, did not have any impact on economic growth.

Agbetsiafa (2003), brings the issue of causality even closer to home when he investigates the issue of causality between finance and growth on a number of sub-Saharan African countries by testing whether the levers of financial sector development exerts causal impact on economic real per capita GDP growth using the co-integration test procedure which was initially proposed by Johansen and Juselius, and causality test based on vector error correction model (VECM). The empirical results of the study indicate that each of the financial development indicators and economic growth are co-integrated of order one. Furthermore, co-integration test results show that financial development and economic growth are linked in the long-run in seven of the eight countries in the sample. Thus, with

respect to causality tests, the author found that there was predominance of uni-directional causality from finance to growth in six countries (namely, Ghana, Nigeria, Senegal, South Africa, Togo, and Zambia), and economic growth to financial development in Ivory Coast and Kenya.

Following the Agbetsiafa, Abu-Bader *et al.* (2005) implemented the causality tests on different periods of time within a trivariate VAR for five MENA countries: Algeria, Egypt, Morocco, Tunisia and Syria over the period 1960-2004. This study differs from the one discussed earlier as this one deals with countries north of the sub-Saharan countries. The panel also includes one country from the Middle East. In carrying out the empirical tests, the authors employ four different measures of financial development besides the income variable which include: ratio of money to stock, ratio of M2 minus currency to GDP, ratio of bank credit to the private sector to GDP and last but not least credit issues to nonfinancial private firms to total domestic credit. The results obtained show weak support for long-run relationship between finance and growth for the finance-led hypothesis. Further, in cases where co-integration was detected, Granger causality was either bi-directional or it ran from output to financial development. In this respect the authors therefore argue that the causality pattern vary across countries depending on the financial proxy used. This result highlights one important issue and that is statistical inference based on cross-country regressions or using financial development proxies that does not capture the different mechanisms through which financial development can lead economic growth.

Ncube (2007) departs slightly from the use of the usual econometric rigor by conducting a study where he investigates ways in which the financial sector can lead economic growth in Africa by just applying the theory and trends. In this regard the author uses the theory based on the structure and characteristics of the financial sector system in Africa that may affect economic growth. The issues covered are vast and include: weak regulation environment, weak legal systems, bank-based vs market-based system, wide spreads of interest rates, poor corporate governance, inadequate design of deposit insurance, oligopoly banking structure, absence of banking innovations, inefficient deposit and payment system, small and shallow stock markets, market fragmentation, informal systems and low levels of financial deepening. In this detailed analysis of characteristics of financial system, Ncube found that financial sector systems do affect the impact of financial services on economic growth and development. In view of this the author implores the policy makers to come up with policies

that can mitigate against the distortionary effects of the characteristics in order to promote economic growth.

Gries *et al.* (2008) make yet another contribution on finance-growth nexus by testing for causality between financial deepening, trade openness and economic development for 16 sub-Saharan African countries. An advanced econometric methodology is applied to add to existing empirical evidence. Only limited support is found for finance promoting regional development. In particular, support for the popular hypothesis of finance-led growth is not substantial. In general, it is found that financial deepening and trade openness have swayed regional development only marginally. Thus, development strategies prioritising financial sector or trade liberalisation cannot be supported. Instead, a holistic policy approach taking into account other fundamental development factors is advocated.

2.2.6.2 Country Specific Case Studies

Based on a number of problems associated with cross-country studies and also the reforms policy which have been implemented since the 1980s, the thesis now reviews some of the studies which have specific reference to the time series and that are country specific starting with the work on Kenya which was done by Odhiambo.

Odhiambo (2004) examines the dynamic causal relationship between financial depth and economic growth in Kenya. As opposed to the usual bivariate model the author in this case allows for an additional variable savings as an intermitting variable thereby creating a simple tri-variate causality model. Using the co-integration and error-correction techniques, the empirical results of this study reveal that there is a distinct uni-directional causal flow from economic growth to financial development. The results also show that economic growth Granger causes savings, while savings drive the development of the financial sector in Kenya. The lessons picked from this study, therefore, warn that any argument that financial development unambiguously leads to economic growth should be treated with extreme caution.

In a quest of covering more country specific studies, Odhiambo (2005a) investigates the role of financial development on economic growth on yet another east African country, Tanzania. Just like in his previous study on Kenya in this study he uses more variables in his model by including three proxies of financial development against real GDP per capita. Using the Johansen-Juselius co-integration method and vector error-correction mechanism, the

empirical results of this study, taken together, reveal bidirectional causality between financial development and economic growth in Tanzania even though a supply-leading response tends to predominate. When the ratio of broad money to GDP ($M2/GDP$) is used, a distinct supply-leading response is found to prevail. However, when the ratio of currency to narrow definition of money ($CC/M1$) and the ratio of bank claims on the private sector to GDP (DCP/GDP) are used, bi-directional causality evidence seems to prevail. The study therefore recommends that the current financial development in Tanzania be developed further in order to make the economy more monetised.

Abu-Bader *et al.* (2005), examines the causal relationship between financial development and economic growth in Egypt during the period 1960-2001 within a trivariate VAR setting. They employ four different measures of financial development and apply Granger causality tests using the co-integration and vector error correction methodology. Their results show that there is support for the view that financial development causes economic growth either through increasing investment efficiency or through increasing resources for investment. This finding suggests that the financial reforms launched in 1990 can explain the rebound in economic performance since then and that further deepening of the financial sector is an important instrument to stimulate saving/investment and therefore long-term economic growth.

Frank (2007) departs from the bank vs. growth model by examining the effect of stock market expansion on South Africa's economic development covering the period from 1989 to 2001 and uses a simple OLS model. In this model the author includes the following variables: real GDP per capita, ratio of bank credit to the private sector to GDP, index of stock market volatility and index of stock market development. Surprisingly, the author finds counter intuitive results of statistically significant negative relation between stock market development and economic growth.³ The explanation advanced in this regard is that of data and argues that the presence of thin trading prevents the theorised benefits of market development from accruing to the economy.

Quartey *et al.* (2008) investigates whether financial development in Ghana conforms to either the Supply-leading, demand-following or Patrick's Stages of development hypotheses. A bivariate VAR model is estimated in four scenarios, after which Granger causality test,

³ Other results explaining credit and stock market volatility holds. They both have correct signs and are statistically significant.

Impulse Response Function and Variance Decomposition analyses were conducted for each respective scenario of the VAR. Whereas there is some evidence in support of demand-following hypothesis, when growth of broad money to GDP ratio is used as a measure of financial development, there is no significant evidence to support either the supply-leading or demand-following hypotheses when growth in domestic credit to GDP ratio, private credit to GDP ratio, and private credit to domestic credit ratio are used as proxies for financial development. Also, in all the four cases, there is no statistical evidence to support Patrick's stages of development hypothesis in Ghana.

2.2.6.3 Financial Liberalisation and Growth Studies

Oshikoya (1992) used time series econometrics to see how interest rate liberalisation has affected economic growth in Kenya. The author used data from 1970 to 1989 and the results showed a negative and insignificant coefficient for the real interest rate. The sample was then split into two sub periods: 1970-1979 and 1980-1989. The real interest rate had a negative and significant coefficient for the 1970-1979 period, but was positive and significant for the 1980-1989 period; thus offering no robust result of the effect of interest rate liberalisation on growth.

Berthelemy (1997) reports the disenchantment with financial liberalisation in Senegal due to a reduced access to credit. According to him, liberalisation resulted in excessively high positive interest rates and in the new environment, banks found it difficult to identify and select investment opportunities. Most banks therefore ended up not lending and holding excess liquid assets. In addition, following liberalisation, over 70% of bank lending was short-term with small and medium-scale enterprises (SMEs) experiencing a sharp reduction in access to finance.

Ayogu, *et al.* (1998) analysed Nigeria's experience with financial reforms and concluded that reforms have neither enhanced the financial system nor improved macro-stability.⁴ While reforms resulted in a sharp increase in the number and types of financial intermediaries, there was no significant change in financial depth and the quality of financial services did not improve. Financial fragility emerged with the collapse of many banks; private sector access

⁴ The finding by Ayogu, is very much related to what has happened in the three study counties (South Africa, Kenya and Zambia) in that financial liberalization has not led to much development of their financial sector. In some cases like Zambia and South Africa the financial sector has even declined or remained flat as proxied by credit to the private sector by commercial banks. Only Kenya seems to show some great improvement after liberalization.

to credit shrank as fiscal deficits ballooned (mostly financed by the banking system) and a mushrooming of insider lending and bad loans implied that the efficiency of credit allocation deteriorated. Fiscal deficits put monetary policy under considerable pressure and impeded the effectiveness of indirect monetary instruments. However they attributed these adverse results to the inconsistent and ad hoc implementation of the reform programme, with frequent policy reversals creating credibility problems. The Nigerian authorities also failed to strengthen prudential regulation and supervision leading to excessive risk-taking by banks and other financial institutions. Mass opposition to the Structural Adjustment Program (SAP), of which financial reforms were a part, also complicated implementation and sharply reduced the likelihood of a positive outcome.

In evaluating Uganda's experience with financial liberalisation, Aleem *et al.* (2001) also report reduced access to finance. Although liberalisation reduced bank concentration, and almost doubled monetary depth and the share of bank deposits in GDP, it also led to a sharp reduction in the access of micro-enterprises and farmers in the rural areas to credit and perversely, liberalisation has led to an expansion of the informal financial sector which now provides the bulk of financial services to these underserved segments of the population. This phenomenon is due to the removal of state-intervention in credit allocation without any viable alternative framework in a liberalised regime. Unlike in Asia where financial liberalisation has led to banks expanding into rural areas (see Williamson & Mahar, 1998), liberalisation in Uganda seems to have resulted in a retrenchment of banks from rural areas. Indeed, in India, authorities continue to maintain directed credit schemes despite the move to a more liberalised financial system due to fears of an undesirable pull-back of financial institutions from rural areas (see Sen & Vaidya, 1998).

There were other costs of liberalisation in Uganda, including higher real and nominal interest rates and the bailout of unsound banks that were allowed into the system (low quality at entry). Therefore, from 1995, more emphasis was placed on institutional development, especially improvements in banking supervision and enhancing the skills of bankers to cope with a liberalised financial system.

Olumuyiwa *et al.* (2007) developed panel co-integration techniques which they applied to data for six African countries to test the Feldstein-Horioka approach to measuring capital mobility. The results suggest three conclusions: savings and investment in panel data are non-stationary series and they are co-integrated; capital was relatively mobile in the African

countries during 1970-2000, with estimated savings retention ratios of 0.73 (FMOLS), 0.45 (DOLS), 0.51 (DOLS with heterogeneity) and 0.39 (DOLS with cross-sectional dependence effects); and there was a marked drop in the savings retention ratio from 1970-85 to 1986-2000. These results could imply that capital mobility in African countries has increased, reflecting the implementation of market-orientated reforms, including the privatisation and rationalisation of the public sector, and the partial liberalisation of their exchange rate regimes and financial systems.

2.3 Theoretical Framework

In the following section, possible impact patterns, directions of influence in the interplay between the financial and the real sector and their basis are discussed. Transmission channels and both macro and industry-level structural effects are depicted.

2.3.1. Possible causal links between finance and real growth

The relation between the financial development and the economic growth can be classified in terms of causality with respect to five possible hypotheses: (1) no causal relation; (2) demand-following; (3) supply-leading; (4) negative causal link from finance to growth; (5) interdependence. In addition, a number of syntheses can be based on the five hypotheses, basically with respect to evolutionary sequencing or different needs on the part of industries or types of enterprises.

The view that financial sector development is not significantly related to real growth is expressed most prominently by Lucas (1988: 6). As Graff (2000: 3) points out, this assertion is consistent with a neo-classical world of zero transaction costs and perfect information we may add. In such a world the Modigliani-Miller theorem (See Modigliani and Miller, 1958) holds that the way firms finance themselves is irrelevant (their irrelevance propositions), which is consistent with the perception that financial markets as independent entities from the rest of the economy and so finance and growth are unrelated. On the other hand, there are still economists who would argue that finance and growth are unrelated.

The difficulty of establishing the link between financial development and economic growth was first established by Robinson (1952: 86). Robinson's statement that "finance follows where enterprise leads" is often quoted, when it comes to arguing that the causal relation runs from the real to the financial sector (demand-following finance). This hypothesis regards

financial development as endogenously determined by the real economy or its needs.⁵ This view is consistent with the Coase theorem (see Coase, 1956) and much of New Institutional Economics where it is argued that institutions adjust to market imperfections in a way that maximises individual utilities. The demand-following approach is often based on empirical evidence and regarded as a temporary situation that may persist only under special circumstances, such as transition to a market economy.

The modern branch of the supply-leading finance literature starts with the works of McKinnon (1973) and Shaw (1973). The supply-leading hypothesis posits a causal relationship from financial development to economic growth, which means deliberate creation of financial institutions and markets increases the supply of financial services and thus leads to real economic growth. Numerous theoretical and empirical writings on this subject have shown that financial development is important and causes economic growth. King and Levine (1993a, b), Neusser and Kugler (1998) and Levine, Loayza and Beck (2000) support the supply-leading phenomenon.

On the other hand, the demand-following hypothesis postulates a causal relationship from economic growth to financial development. Here, an increasing demand for financial services might induce an expansion in the financial sector as the real economy grows (i.e. financial sector responds passively to economic growth). Gurley and Shaw (1967), Goldsmith (1969) and Jung (1986) support this hypothesis.⁶

Apart from the three competing hypotheses, there is a fourth one, mainly held by a minority and argues that finance has a detrimental effect to the real development of an economy. Economists supporting this view regularly refer to the danger of financial crises, often in relation with speculative bubbles (Bhatt, 1995) or, more generally, the veiling of fundamentals of the real economy, particularly through capital market speculation. This strand of literature is often motivated by the observation of poor economic performance accompanied by financial market growth in particular world regions, especially Latin America, during the past 20 to 30 years.

⁵ Endogenously determined means that financial sector is determined within the gun model.

⁶ According to this view, the lack of financial institutions in some less developed countries is simply a manifestation of the lack of demand for their services.

Much of the empirical evidence, but also the theoretical discourse, suggests that both arguments in favour of supply-leading and demand-following finance are of relevance. This implies that the causal link between finance and real growth runs in both directions. This mutual influence may be exerted at the same time, implying that financial depth (i.e. large financial markets) drives real growth, while the growing economy's demand for finance is met by the advancing financial sector. Alternatively, or indeed additionally, it may depend crucially on an economy's general development stage whether its financial sector is supply-leading or demand-following. The most prominent hypothesis of such a sequential pattern of causation was forwarded by Patrick (1966). Patrick argues that underdeveloped countries can gain significantly in real terms from developing their financial sectors (supply-leading finance), whereas in highly developed economies finance becomes increasingly demand-following. This is contrasted by Gerschenkron's (1962) assertion that developed economies tend to become increasingly supply-leading as production becomes more and more capital intensive.

While there is some truth in the above arguments, the consideration is that it is important not to lose perspective. Financial institutions and systems in this regard, banks and securities markets, are regularly at the centre of attention of research and policy advice. They are, however, not the sole and not even the most important providers of finance for investment. Strikingly, the clearly dominant source of corporate finance is cash flow. Thiel (2001), reports that in Germany more than 50% of investment is financed through cash flow and depreciation. Graff (2000) summarises empirical evidence from a number of studies stating that, no matter how developed financial markets may be in a particular country, self-financing is always dominant and above the 50% margin. Ignoring the dominant role of cash flow, sometimes referred to as 'financial xenophobia' (Nyman, 2001), implies the danger to overemphasise the importance of the financial system's contribution to real development in theory and to be surprised by a seemingly weak empirical performance of financial market variables. Furthermore, the important role of cash flow financing may lead to a counterintuitive empirical short-run bias, as other sources of finance may serve as substitutes for self-financing and therefore run counter to the business cycle (Thiel, 2001:12). Generally speaking, the use of internal funds is difficult to quantify which is one reason why they are widely ignored in empirical studies. Interesting exceptions are the recent works of Rivaud *et al.* (2001) and Laevens (2002). African experience relating to this literature will be reviewed later in 2.3.5.

2.3.2 Transmission Channels

It is generally argued that the financial system plays a growth-supporting role and also takes on additional market functions. Financial institutions develop out of the need to deal with transaction costs and overcome information problems (Levine, 1997: 891). They influence the real economy by enhancing capital accumulation and innovation. Capital accumulation as an endogenous determinant of real growth is in line with the traditional (neo-classical) growth theory. The development of endogenous growth theory focuses on innovation as a determinant of real growth and offers thus a more important role for finance as a driving force of the real economy (Thiel, 2001).

Senhadji (2000) estimates a Cobb-Douglas production function and discriminates between growth due to capital accumulation on the one hand, and factor productivity growth on the other. He finds large regional disparities and a particularly high contribution of productivity growth to real GDP growth in underdeveloped countries. Claessens and Laeven (2002) construct a model which distinguishes between a 'finance effect' and an 'asset allocation' effect. The latter influences the ratio of investment in fixed assets relative to investment in intangible assets. According to this model the asset allocation effect is just as important for real growth as the finance effect. Capital accumulation and factor productivity are the major channels through which real growth can be stimulated by the financial system. The financial system mobilises dispersed (hoarded) savings and pools them in order to make them available for investment. This function is fundamental, as many investment projects require larger amounts than one individual is able or willing to provide. It is also performed indirectly by diversifying liquidity and more general risks.

Furthermore, the financial system influences resource allocation with respect to investment productivity, both directly and indirectly. Banks and financial markets specialise in the acquisition and transformation of information on investment projects and supposedly perform these functions more efficiently than savers could, as duplication of efforts is avoided and transaction costs are reduced. In this respect the financial system also deals with agency problems which stem from asymmetric information between the borrower and the lender. This implies an investment project evaluation function and an ex post monitoring function of the intermediaries and securities sectors (corporate control).

2.3.3 The Structure of Financial Systems

The discussion on the optimal or the most growth-supportive financial structure focuses very much on the question whether banks or the capital market produce better outcomes. Arguments in favour of either view are reviewed from a macro and a micro/industry perspective. It is argued that there is both competition and functional complementarity of capital markets and financial intermediaries. The suggestion put forth in literature is that of using the terms “bank-oriented” and “securities-oriented” instead of the value-loaded terminology often applied.

2.3.3.1 The Macro Perspective

Theoretically, the most important characteristics separating the two systems concern the provision of information and of corporate control (Graff, 2000: 28 ff.). Financial contracts between intermediaries and borrowers regularly take extensive information on particular projects into account. The extent to which information is truly reflected in share prices, however, is doubtful (e.g. Stiglitz, 1989). But even in case securities markets that reflect information correctly, externalities may hamper the efficient functioning of the market more severely than is the case with intermediaries. Banks are specialised in acquiring and processing information on investment projects. If a project fails, a bank is among the few parties that suffer from the resulting losses. The incentive to engage in serious information management is therefore high. On the capital market there are regularly a large number of financiers with low incentives to acquire information (potential free riders). Information on the worthiness of investment projects is correctly or incorrectly incorporated in publicly observable market prices. Consequently the limited incentives are accompanied by information spill-over effects. Standard economic behavioural assumptions concerning self interest, however, generally lead to the conclusion that negative external effects of non-exclusivity prevail over positive spill-over effects.

On capital markets corporate control is exerted in an impersonal way by (not) buying and selling equity (so-called ‘arm’s length finance’). The ultimate threat to an arguably bad management is a potential take-over. Bank-oriented systems are characterised by long-term relationships between lender and borrower. This has led to the conclusion that corporate control would be better performed by capital markets due to their harder budget constraints. Yet this assertion fails to take into account the potential benefit of a common effort of saver

and lender to save projects. This potential benefit should be weighed against the potential costs of a softer ex ante budget constraint.

Corbett (1990) highlights the important role of banks as institutions which have both the potential and the incentives to strive for reorganisation of companies in trouble. She infers from the dominant fraction of external investment that is financed through banks in most countries that capital markets play more of a corrective or residual role within the financial system. Most importantly, capital markets contest credit markets when they fail to allocate capital efficiently to promising projects and they are a means of evaluating the residual real value of corporations when reorganisation has failed (Corbett, 1990).

With reference to the establishment of hard budget constraints in bankruptcy laws of Central and Eastern European EU accession countries, Revoltella (1998) highlights the existence of a binding trade-off between flexibility and rigidity. Particularly for some transition countries this trade-off may extend to a trade-off between efficiency and (system) stability, given the fragility of financial systems in some of these countries. Hawkins discusses the question of possible substitution effects between bank credit and bonds. Emphasising on emerging economies including some CEECs he finds that the development of bond markets which typically lags behind the emergence of effective banking systems may have slowed down banking sectors' growth over the long term (Hawkins, 2002). However, he finds no consequent contraction of the banking sector and concludes "that it is important to have healthy banks to have a sound bond market. And a bond market may improve the health of banks, by improving market discipline." Mihaljek *et al.* (2002: 24 f.) find empirical evidence for positive correlations between three financial sectors and constitute various forms of spill-over effects from the banking sector to the other two market segments. Hellwig (1998) argues that financial intermediaries perform an important market making function for capital markets, i.e. there is direct complementarity for both financial segments. Similarly it can be argued that certain products offered by banks, like investment funds, are necessary to help savers access capital markets despite limited information. Building on this idea of complementary relations between the various market segments (and all other parts of the financial system) Schmidt *et al.* (2001) analyse the financial systems of Germany, France and England. They cannot find any signs of superiority of either of the two and claim that the consistency of a system is much more important than the type of a system itself. Moreover, as smooth transition from one system to another requires temporary inconsistency they also

question the possibility and usefulness of a smooth convergence of financial systems. In the case of South Africa, Zambia and Kenya, banks appear to be superior with respect to their role in financial intermediation.

Caution has to be applied with regard to terminology used. A considerable part of the literature emphasising the design of financial systems is preoccupied with the classification of systems as either 'market-based' or 'bank-based'. This thesis considers this terminology misleading, because the provision of finance through banks and other intermediaries also involves markets.

2.3.3.2 The Micro/Industry Perspective

While in this research context the above mentioned institutional factors accounting for differences between financial systems are more important, a branch of the literature analyses capital structures from a micro-perspective. This approach builds on the fact that markets and intermediaries perform very different functions reflecting the heterogeneous needs of the respective clients and client industries willing to invest. Borrower characteristics are of particular importance for potential access to various financing instruments, whereas project characteristics primarily (though not exclusively) influence companies' financial choices. The organisational structure, the reputation, the availability of collateral or the sheer size of a company may limit its access to certain financial instruments.

Capital markets are said to be superior in processing rather uncertain information about innovative and potentially highly rewarding projects (Thiel, 2001); Small companies normally have no access to share or bond markets; banks may provide finance for small, decentralised projects more efficiently than centralised capital markets (Smith, 1992); access to trade credit as substitute for bank loans and other forms of credit might be different and so forth. Zingales (1995) analyse not only the influence of (cross-country) institutional factors but also of firm characteristics on their financing structure. Size and profitability of a firm, as well as tangibility of assets (ratio of fixed to total assets) or the ratio of book to market value are assumed to be correlated with financial leverage. They find that tangibility of assets is positively correlated with leverage, while a negative relationship exists between profitability of enterprises and leverage. Guiso, Sapienza, Zingales (2002) show empirically that small and medium-sized enterprises in Italy rely heavily on local access to bank credit, whereas

large Italian-based corporations find finance investment in various ways, notably on international markets.

Carlin and Mayer (1998) investigates the link between industry activity, financial industry structures and legal environment. Among the manifold indicators considered, they find strong evidence that the relations between financial structure and economic activity come through expenditures on R&D rather than fixed capital formation.

Both theoretical and empirical considerations clearly illustrate that various financial instruments serve the heterogeneous needs of heterogeneous companies. From a company's perspective another vital question concerns the maturity of financial contracts. In bank-oriented systems banks provide both short- and long-term finance on a regular basis to all types of clients, including large corporations. In securities-oriented systems, corporations access long-term finance primarily via capital markets and also raise a considerable proportion of working-capital finance via commercial paper programmes.

Obviously, financial systems react to heterogeneous and changing needs, as is evident from the appearance of new instruments, e.g. venture capital. This is consistent with the notion of "varieties of capitalism". At the same time it is clear that other factors, like politics, history, or the legal framework (common law systems vs. civil law systems) influence the financial system (Roe, 1994; Carlin and Meyer, 1998). This variety of determinants is reflected by the heterogeneity of financial systems across countries. While the factors mentioned may play an additional explanatory role, it is very hard to control them (Carlin and Meyer, 1998:1).

2.3.4 Theoretical Models

Graff (2001: 89) points to the fact that standard works on endogenous growth theory largely ignores the potential influence of financial markets. Yet the finance-growth literature regularly constructs models on the basis of endogenous growth theory. Pagano (1993) uses an AK production function with A being a variable indicating the economy's general efficiency in using the capital stock K. He then goes on to redefine the closed-economy equilibrium condition by use of a variable indicating the costs associated with the financial system's activity, i.e. only a fraction of income saved transforms into investment, the rest being used up by the financial system.

In this model the real growth rate can be raised by an increased savings rate, a rise in the overall efficiency parameter A or an increased financial system parameter. As the two efficiency parameters can be assumed to be significantly correlated, however, it becomes difficult to interpret the financial efficiency parameter that is of major interest. A highly developed, capital intensive economy uses a relatively high fraction of real income for running the financial system, which does not necessarily imply that this system is inefficient. To go one step further, by taking into account the costs of a financial system and its ability to promote real growth, it should be possible to determine the optimal size of an economy's financial sector (relative to the real economy).

Based on a theoretical model of Holmstrom, Tirole (1997) and Santomero, Seater (2000) claim the optimal size of a country's financial sector can be determined. Yet their result that the optimal relative size is independent of an economy's state and the business cycle does not seem too realistic. Even in the long run and irrespective of the development stage the optimal relative size of a financial sector may vary across economies, e. g. because of differences in capital intensities. Focussing on transition economies Fink-Haiss (1999a, 1999b) construct a model where the size of a financial market converges to a steady-state in the very long-run. The speed of convergence depends on the savings ratio and real GDP growth.

A number of models have been specified in a fashion similar to Pagano (1993). An excellent overview of this theoretical strand of the literature can be found in Graff (2001). Several studies attempt to model demand-following and supply-leading finance simultaneously. Greenwood, Jovanovic (1990) describe a real economy with higher growth resulting from improved allocation due to the development of the financial sector which in turn produces a more sophisticated and thus more efficient financial sector. They also take into account the higher costs of a more sophisticated financial sector. In the model of Berthélemy, Varoudakis (1994) reciprocal causality leads to multiple equilibriums and the possibility of being caught in a poverty trap. Reciprocity arises due to the assumption of an initially highly concentrated financial sector becoming more competitive with the growing real sector which in turn is boosted by the increasing efficiency of the financial sector. Saint-Paul (1996) models reciprocity as a consequence of learning processes in the financial sector which may also lead to poverty traps, a possibility that exists also in the model of Lee (1998).

2.3.5. Evidence from Empirical Studies

Goldsmith (1969) provided the seminal empirical work linking the performances of the financial sector with that of the real economy. He defines a variable FIR (financial interrelations ratio) by dividing the aggregate value of financial wealth by total wealth or, more operationally, GDP. Amongst his famous twelve stylised facts there is the observation that the finance interrelations ratio is increasing steadily, approaching a certain value asymptotically. According to the findings reported in this section on size, structure and dynamics of financial markets, however, transition economies' financial interrelations ratios do not generally grow faster than those of more developed ones. One could argue that this may simply reflect non-linearity and the very short observation period. By contrast, Goldsmith's (1969) observation period ranges from 1860 to 1963. However, a recent study of Rajan, Zingales (2001) reveals that even most industrialised countries relapsed from a peak level of financial development in 1913 and could not return to this level until the 80s of the 20th century.

Industrial countries which have lost their function as important financial centres, like Austria, are still far away from their peaks. Starting with Goldsmith's (1969) study a vast empirical literature arose and its growth has gained momentum over the decades to follow. Levine (1997), Graff (2000), and Thiel (2001) provide valuable overviews. This study compares and reviews the findings of three spheres of research: bank-centred, stock-centred and cross-country studies on the finance-growth nexus. The review finds that bond financing is still widely ignored by the empirical literature.

Ignoring the bond markets poses a limitation that most empirical studies encounter. Domestic growth and therefore the impact of domestic capital sources usually is a core concern of macroeconomic policy. A point to bear in mind in this respect is globalisation of financial markets. As financial markets continue to integrate, particularly in Europe and indeed Africa, the contribution of national financial systems to their national real economies becomes increasingly blurred. It has been shown by Thiel (2001) that intra-European capital flows have a certain bearing on national savings and investments within member states, a measure frequently applied to demonstrate the degree of international financial integration. However, while this mirrors the somewhat advanced level of integration of the European wholesale financial market, integration in retail financial markets is much less advanced (Schuler and Heinemann, 2002). The European Commission found it necessary to speed up the hitherto

slower than expected financial market integration by calling in the Lamfalussy Report and by establishing the Financial Sector Action Task Force. Both provide further evidence that the country financial markets still are of focal concern.

2.3.5.1 Cross-country studies

Morris (1968) provided one of the first cross-country studies involving the relationship between the financial and real sector. Finance is not at the centre of attention from the outset of this work, but among a number of institutional and socio-economic explanatory variables. Financial factors turn out to be among the most significant driving forces of growth. Levine, Renelt (1992) and Sala-i-Martin (1997) perform extreme-bounds analyses of growth determination on an even broader basis, whereby financial variables are just a few of many variables possibly affecting real growth. The result is that a whole range of (non-financial) variables explains real growth to some extent, whereas financial variables are ineffective. However, as Sala-i-Martin (1997: 182) concedes, this holds true for his search for linear relationships, whilst the finance-growth literature regularly postulates non-linearity. Average values over longer periods are frequently used for growth regressions. Increasingly, pooled data are used with five-year steps (King and Levine, 1992, Berthélemy and Varoudakis, 1997, Graff, 2001, etc.).

2.3.5.1.1 Cross-country studies concentrating on banking intermediation

The cross-country approach has been criticised for ignoring national and regional differences of economies by Thiel (2001) and others. Odedokun (1996) and Berthélemy, Varoudakis (1997) apply fixed-effect models involving large numbers of countries of approximately 81 and 82 respectively. Both studies arrive to a considerable extent at results indicating a negative effect of money aggregates on real growth. These results conflict with the majority of cross-country studies which tend to find positive effects of financial intermediation on growth. Berthélemy, Varoudakis (1997) provide a differentiated interpretation of their results, arguing that particularly in poverty traps financial systems cannot perform their otherwise beneficial function.

Fourteen out of 21 articles in Table 6 are concentrating on intermediation-related variables find a positive relationship between intermediation and real output. One of them is Levine *et al.* (2000) who explicitly tackled the endogeneity problem in their panel analysis by

attempting to extract the exogenous part of their intermediation variables by use of legal indicators.

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Table 6: Cross-country studies: banking intermediation covered only

	Year	Sample coverage: region	Sample coverage: time	Dependent variable	Explanatory financial variables I: banking intermediation	Control variables, other variables	Method	Investigated links	Major findings	Additional results
Wallich	1969	43 countries (no details available)	1956-1965	Real GDP growth	Claims of banks against private sector / total domestic bank claims; (M1+M2)/GDP	Investment rate; income per capita; inflation	Panel regression analysis	Links between banking intermediation and economic growth	Positive relationship Between intermediation and growth, if investment rate does not enter Regression	Investment rate is the key factor that links financial with real development
Bhattacharyay	1988	45 countries (no details available)	1985/86	Real GDP per capita	Cash / M2		OLS regression analysis	Links between financial deepening and income	Negative relationship between cash/M2 and output	
Gelb	1988	45 countries (nodetails available)	1985/86	Growth of real GDP per capita; coefficient of marginal capital; investment rate	Credit interest rate	Convergence; population growth; inflation; etc.	OLS regression analysis	Links between credit interest rate (liberalisation) and economic development	Liberalisation inducing higher credit interest rates is positively related to real economic development	High credit interest rates do not harm investment
Ghani	1992	52 developing Countries	1965-1989	Real growth per capita	M3/GDP	Various variables; on political, social and economic circumstances	Growth regression analysis	Links between financial depth and economic growth	Positive relationship between initial financial depth and real growth	
King, Levine	1992	85 countries (up to 19 EU+; up to 3 ACC)	1960-1989	Growth of real GDP per capita	(M2-M1) / GDP	Convergence; population growth; school enrolment; investment rate; government spending / GDP; regional dummies	Cross-country regressions and panel egression analysis (5-year steps)	Links between banking intermediation and economic growth	Positive relationship between financial and real sector with cross-country-analysis, but weak negative relationship with panel approach	
King, Levine	1993a	Up to 80 countries (up to 19 EU+; up to 3 ACC)	1960-1989	Growth of GDP; capital stock; and productivity	Liquid liabilities / GDP; assets of commercial and central banks / GDP; private credit / GDP; credits issued to private enterprises / GDP; credits issued to private and public enterprises and local governments / GDP	Initial GDP; school enrolment; trade exposure; government spending / GDP; inflation	Panel analysis (5- year periods)	Links between financial intermediation and economic growth	Positive relationship between financial intermediation and economic growth	
King, Levine	1993b	Up to 80 countries (up to 19 EU+; up to 3 ACC)	1960-1989	Output growth; capital stock growth; productivity growth	Liquid liabilities / GDP; assets of commercial and central banks / GDP; private credit / GDP; credits issued to private enterprises / GDP; credits issued to private and public enterprises and local governments	Initial income; school enrolment; trade exposure; government spending / GDP; inflation	Panel analysis (5- year periods)	Links between banking intermediation and economic growth	Positive relationships between financial intermediation and economic growth	Case studies and firm-level studies: liberalisation of the financial market leads to higher growth rates, but also seems to be related to the financial crisis that occurred in many countries 3-5 years after financial liberalisation

Continuation

Authors	Year	Sample coverage: region	Sample coverage: time	Dependent variable	Explanatory financial variables I: banking intermediation	Control variables, other variables	Method	Investigated links	Major findings
Gertler, Rose	1994	69 developing countries (no details available)	1950-1988	Real GDP per capita	Bank credit to non-financial sector / GDP; (M2-M1)/ GDP	Investment rate; dummies for countries, regions and time	Panel regressions analysis	Links between banking intermediation and state of real economic development	Positive relationship between intermediation and real economy
Japelli, Pagano	1994	30 countries (18 EU+; 1 ACC)	1960-1985	Growth of real income per capita	Maximum amount of credit accessible for private households relative to secured assets	Investment rate; convergence; macroeconomic and socio-political variables	Growth regression analysis	Links between access of private households to credit and economic growth	Negative relationship between private households' access to credit and real growth
De Gregorio, Giudotti	1995	95 countries (19 EU+; 3 ACC)	1960-1985	Growth of real income per capita	Bank credit to non-financial sector	Investment rate; school enrolment; size of public sector; political stability	Growth regression analysis	Links between banking intermediation and economic growth	Positive relationship between intermediation and real growth for whole sample and group of medium income countries
Andrés , Domenech, Molinas	1996	24 OECD countries (no details available)	1960-1990	Growth of income per capita	M1	Investment rate; education; convergence; fiscal variables; inflation; export growth	Panel regression analysis (5-year periods)	Links between Financial development and economic growth	Positive relationship between financial development and real growth
Odedokun	1996	81 developing countries (details not available)	1961-1989	Marginal capital productivity	M1/BIP; M2/BIP; M1/(M2-M1)		Cross-country regression analysis	Links between financial depth and marginal capital productivity	Negative relationship between financial depth and marginal capital productivity
Berthélemy, Varoudakis	1997	85 countries (details not available)	1960-1990	Growth of real income per capita	ln (M2/GDP)	Convergence; investment rate; inflation; education; trade exposure; etc.	Panel regression analysis (5-year periods)	Link between financial depth and economic growth	Negative relationship between financial depth and real growth
Graff	2000	93 countries (18 EU)	1960-1990	Growth of real GDP per capita	Variable composed from bank density, relative banking sector employment and financial sector size	Inflation; regional dummies; variables on trade, public sector, and political stability	Panel regression analysis (5-year periods), path analysis	Links between banking intermediation and economic growth	All possible causality patterns and occasional negative relationships found; supply leading has become dominant since mid-seventies
Beck, Levine, Loyaza	2000	77 countries (19 EU+; 2 ACC)	1960-1995	Growth of real GDP per capita	Private credit / GDP; liquid liabilities / GDP; credit by deposit money banks / GDP	Various legal indicators; trade exposure; inflation; government size; education; initial GDP per capita; black market premium	Cross-country and dynamic panel regression analysis (legal indicators used as instrumental variables)	Links between banking intermediation, legal framework, and economic growth	Positive relationship between exogenous components of intermediation and real growth

Continuation

Authors	Year	Sample coverage: region	Sample coverage: time	Dependent variable	Explanatory financial variables I: banking intermediation	Control variables, other variables	Method	Investigated links	Major findings	Additional results
Levine, Loyaza, Beck	2000	71 countries (19 EU+; 2 ACC)	1960-1995	Growth of real GDP per capita	Liquid liabilities / GDP; assets of commercial and central banks / GDP; private credit / GDP (private credit from central bank not included)	Legal origin; Legal indicators to extract external component; inflation; trade exposure; black market premium	Cross-country OLS and Generalised Method of Moments (GMM)	Links between banking intermediation and economic growth	Exogenous financial sector component correlated with real growth	
Jaffee, Levonian	2001	49 countries (19 EU+; 11 ACC); EU+ primarily	1995	Real GDP per capita	Asset ratio and bank (density) ratio referring to actual numbers relative to benchmarks given by OECD countries	EBRD banking rating	OLS cross-country regression analysis	Links between economic and banking system development in OECD and transition countries	Significant positive relationship between number of banks and banking sector reform (measured by EBRD banking rating) on the one hand and GDP per capita on the other	Convergence of transition economies' banking systems with those of OECD countries is in progress.
Rousseau, Sylla	2001	17 countries (13 EU+; 0 ACC)	1850-1997	Growth of real GDP per capita	Broad money relative to GDP	Initial real GDP; initial trade exposure; initial government expenditure	Cross-country regression analysis	Links between financial development and economic growth	Strong positive relationship between financial and real sector	Positive relationship between finance and real growth is reduced at later stages of development
Rousseau, Wachtel	2001	84 countries (no details available)	1960-1995	Growth of real GDP per capita	M3 / GDP; (M3 - M1) / GDP; total credit / GDP	Initial real GDP; school enrolment	Cross-country regression analysis	Links between financial development and economic growth	Strong positive relationship between financial and real development	Relationship disappears at high levels of inflation
Al-Yousif	2002	30 OECD countries	1970-1999	Growth of real GDP per capita	M1, M2 / GDP		Panel regression analysis (for time series approach see overview 3)	Links between narrow and broad money respectively and growth	Mostly positive relationship between intermediation and growth	Results are country specific; for further additional results see overview 3
Guiso, Sapienza, Zingales	2002	Italian provinces	1860-2000	Growth of real GDP per capita; firm creation; mark up; average age of entrepreneurs	Rejection rate of potential borrowers at the local level	Initial GDP per capita; infrastructure; average years of schooling; population growth	Panel regression analysis	Links between access to credit and economic growth on the local level	Positive relationship between local financial development and real development	Local financial development is only relevant for SME, but not for large corporations

2.3.5.2.2 Cross-Country Studies Covering Intermediation and Securities

Atje and Jovanovic (1993) employ two different cross-country approaches, one of which involves the estimation of a constant-returns-to-scale production function with capital, labour, human capital, and financial capital as input factors. Their results show a significant, positive impact of capital markets on growth, whereas intermediation variables remain ineffective. These remarkable results have been quoted on a regular basis, but caveats have been put forward with respect to asymmetries in modelling and data coverage discriminating methodologically between the two financial sectors (Graff, 2000: 176 ff.). Furthermore, Harris (1997) challenged the results of Atje and Jovanovic, using the same methodology and concluded that a significantly higher contribution of capital markets to real growth can at best be determined for very few high-income countries.

Most cross-country studies covering both stock markets and banks find that both sectors are positively related to real output. A superior contribution to real output by stock markets compared to banks is found by more studies than the opposite (see Table 7). However, an overview of the cross-country literature on securities and intermediation markets' linkage to growth supports the view of two complementary sectors serving different needs of an economy. Only a few studies cover less developing countries. Haiss (1999) find some evidence that particularly in this kind of countries stock market expansion can have a detrimental effect to real development. This contributes to the picture arising from other studies that economies at low development stages have a relatively higher need for intermediation than for stock market activity.

Table 7: Cross-country studies: financial intermediation and securities covered

Authors	Year	Sample coverage: region	Sample coverage: time	Dependent variable	Explanatory financial variables I: banking intermediation	Control variables, other variables	Method	Investigated links	Major findings
Hodgson	1989	16 OECD countries (no details available)	1960-1984	Growth of real GDP per capita	Proxy variable for institutional flexibility of financial system	Investment rate; convergence; growth of industry production; political stability	OLS regression analysis	Links between flexibility of financial institutions and economic growth	Positive relationship between financial institutions flexibility and real growth
Atje, Jovanovic	1993	94 countries in 2 groups (15 EU+; 0 ACC)	1970-1988 and 1980-1988	Growth of real income per capita	Private credit / GDP; Stock market turnover times investment ratio	Lagged investment rate; population growth	OLS regression analysis	Links between financial sectors and economic growth	Positive relationship between capital markets and growth, no effect of intermediation
Artus	1995	20 OECD countries (no details available)	1965-1989	Average growth rate 1965-1989	Shares / credit ratio	Average investment rate; population growth; growth of real interest rate	OLS regression analysis	Links between financial system structure and economic growth	No significant relationship between financial structure and growth
Harris	1997	49 countries (appr. 19 EU+; appr.	1980-1991	Growth of real GDP per capita	Investment ratio * stock market turnover / GDP	Investment rate; population growth	2SLS regression analysis	Links between financial sectors and economic growth	Very limited positive relationship between capital markets and growth only for high-income countries, contrasting to Atje, Jovanovic (1993)
Demirgüç-Kunt, Maksimovic	1998	30 countries (14 EU+; 1 ACC)	1980-1985	Additional firm growth due to external and long-term finance	Bank deposits / GDP; Stock market Capitalisation; and stock market turnover	Inflation; various GDP variables; legal indicators; government subsidies	Panel regression analysis (industry level)	Links between financial sectors and firm growth	Positive relationships between availability of external finance and firm growth
Levine, Zervos	1998	47 countries (17 EU)	1976-1993	Growth of real GDP; capital stock and productivity; savings	Bank credit / GDP (bank credit loans by commercial banks and other deposit taking banks) ; Capitalisation of Domestic listed Companies / GDP; value traded / GDP; Volatility of share returns	Initial output; enrolment; number of revolutions and other social and political variables	Cross-country regression analysis	Links between financial sectors and economic growth	Strong positive relationship between both financial segments and economic growth; no negative effects caused by share volatility or international capital market integration

Continuation

Authors	Year	Sample coverage: region	Sample coverage: time	Dependent variable	Explanatory financial variables I: banking intermediation	Control variables, other variables	Method	Investigated links	Major findings
Rajan, Zingales	1998	41 countries (15 EU+; 1 ACC)	1980-1990	Growth of real value added	Total capitalisation (domestic credit + stock market capitalisation / GDP); accounting standards	Variables reflecting country-specific and industry-specific characteristics	Panel regression analysis (industry level)	Links between financial development and growth of companies dependent on external finance	Companies depending on external finance grow faster in economies with developed financial systems
Andrés, J., Hernando, I., Lopez-Salido	1999	21 OECD countries (19 EU+)	1960-1990	Real output growth per capita	Liquid liabilities and credit to nonfinancial sector / GDP Stock market Capitalisation / GDP	Investment rate; export growth; inflation; variables for education and convergence	Growth regression analysis + VAR	Links between financial sectors and economic growth	Positive relationship only for stock market
Carlin, Mayer	1999	27 industries in 14 OECD countries (no details available)	1970-1995	Industry growth rate; investment ratio; R&D ratio	Interaction variables linking financial variables with Industry specific characteristics	De-meaning for country and industry-specific characteristics	Panel regression analysis (industry level)	Links between the interaction of industry-specific characteristics and industry growth	Industries with heavy dependence on R&D are very positively affected by financial development Investment in R&D is more important for growth than capital accumulation
Demirgüç-Kunt, Levine	1999	150 countries (no details available)	1990-1998	Real GDP per capita	Various variables covering the financial structure size and efficiency of intermediaries Various variables covering financial structure, size and efficiency of stock markets		Correlation analysis	Links between financial sectors, financial structure and economic growth	Positive relationship between legal environment, financial market development and growth Relatively stronger development of capital markets in developed countries and of intermediaries in developing countries
Fink, Haiss	1999	27 countries (17 EU+; 10 ACC)	1996	GDP	Bank assets Stock market Capitalisation Bonds	Population	OLS regression analysis	Links between financial sectors and real sector	Positive relationship between banking and real growth. Furthermore, Bonds are substitutes for bank credit; stock markets have a weak or even negative impact on real growth, particularly in some EU accession countries

Continuation

Authors	Year	Sample coverage: region	Sample coverage: time	Dependent variable	Explanatory financial variables I: banking intermediation	Control variables, other variables	Method	Investigated links	Major findings
Beck, Demirgüç-Kunt, Levine, Maksimovic	2000	48 developed countries	Various sub periods of 1980-1995	Company; industry and national output growth	Combined indicators of intermediation and capital markets referring to financial structure, financial development market depth etc.	Legal indicators	Cross-country growth regressions, industry level and company level regressions	Link between financial structure, legal framework and economic growth	Link between legal factors and output, but no link between financial system structure and output
Demirgüç-Kunt, Maksimovic	2000	40 countries (18 EU+; 0 ACC)	1989-1996	Additional firm growth due to external and long-term finance	Bank assets Stock market Turnover Financial structure Dummy	GDP variables; inflation; average company size; legal indicators	Panel regression analysis (industry level)	Links between financial system structure and firm growth	Finance-friendly legal rules positively influence positive relationship between financial sectors and growth of firms depending on external finance; Market structure only important for long-term finance
Singh, Singh, Weisse	2000	63 countries (no details available)	1990-1999	Technological development indicators	Stock market capitalisation and number of listed corporations	Technological development indicators	Cross-country regression analysis	Links between stock market development and technological development	No links between stock market development and technological development
Bassanini, Scarpetta, Hemmings	2001	21 countries (18 EU+; 0 ACC)	1971-1998	Growth of real GDP per capita; growth of real private non-residential investment	Liquid liabilities / GDP; private credit from deposit banks / GDP Stock market capitalisation / GDP	Investment; human capital; population growth; inflation; public sector size; trade exposure etc.	Panel regressions analysis	Links between financial depth and real variables	Positive relationship between financial (particularly stock market) and real sector
Cetorelli, Gambera	2001	41 countries (16 EU+; 1 ACC)	1980-1990	Growth of real value added in manufacturing industries	Domestic credit; banking concentration	Industry size; legal indicators; Stock market capitalisation	Panel regression analysis	Links between financial sectors and growth at the industry level	Positive relationship between financial development and growth of value added in manufacturing industry

Continuation

Authors	Year	Sample coverage: region	Sample coverage: time	Dependent variable	Explanatory financial variables I: banking intermediation	Control variables, other variables	Method	Investigated links	Major findings
Leahy, Schich, Wehinger, Pelgrin, Thorgeirsson	2001	19 countries (16 EU+; 0 ACC)	1970-1997	Gross Investment	Private credit from deposit banks / GDP; liquid liabilities / GDP Stock market capitalisation / GDP	Real long-term interest rate; output growth; inflation and its variation; public revenue and spending; trade exposure; legal indicators	Panel error correction approach building on an auto regressive distributed lag (ARDL) model	Links between financial development, financial system, innovation and economic growth	Financial development and finance-friendly legal framework enhance growth via innovation; All financial sectors have a positive impact on growth.
Rivaud-Danset, Dubocage, Salais	2001	9 countries (9 EU+)	1990-1996	Mark-up; value added; return on investment	Own funds; leverage; financial debt structure; liquid capital	Variables controlling for company size	Cluster analysis	Links between companies' financing structures and performance	No correlation between financial variables and industry performance
Claessens, Laeven	2002	Up to 51 countries (18 EU+; 6 ACC)	1980-1989	Growth of real value added	Private credit / GDP; Cash flow	Various legal indicators, especially dealing with property rights; country specific and industry specific characteristics; stock market capitalisation	Panel regression analysis (industry level)	Links between financial development and property rights on one hand, and growth of companies depending on external finance on the other	Companies depending on external finance grow faster in economies with developed financial systems and high property protection
Fisman, Love	2002	42 countries (15 EU+, 1 ACC)	1980-1989	Country pair wise correlation of industry growth	Private and credit / GDP; Stock market capitalisation / GDP	Relative importance of government ownership of banks, trade openness, other variables on education, society, law	Panel regression analysis (industry level)	Link between financial variables and the correlation of same-industry growth across countries	Growth opportunities can only be exploited (indicated by highly correlated industry growth across countries), when the financial sector is well developed
Hahn	2002	23 countries (19 EU+; 1 ACC)	1970-2000	Gross investment	Bank credit to the private sector / GDP; liquid liabilities / GDP; Stock market capitalisation / GDP	Value traded and turnover (in order to control for forward orientation of financial markets)	Panel error correction approach building on an auto regressive distributed lag (ARDL) model *	Links between financial development, financial system and economic growth controlling for forward-looking price effects of financial markets	Only minor causal links between financial development and economic growth, but a strong relationship because of (forward-looking) price effects

2.3.5.3 Time-Series Studies

Whilst cross-country studies usually assume that a possible link between the financial and the real sector must run from finance to the real economy, time-series prominently address the question of causality. This is mostly done by use of Granger causality tests. Uni-directional causality patterns relatively stable over several decades under research has been found very rarely through time-series research. Empirical evidence in favour of the Patrick (1966) hypothesis that a supply-leading pattern characterises early stages of financial and more general economic development is weak. The same is to be noted about the Gerschenkron (1962) hypothesis which states the opposite pattern in the long-run.

2.3.5.3.1. Time-Series Studies Concentrating on Banking Intermediation

The study of Jonung (1997) is unique in that it examines a country (Sweden) over a long time period which is suitable to test long-term causal patterns in the sense of Patrick (1966) or Gerschenkron (1962). Their co-integration analysis shows bi-causality between bank credit and real GDP per capita for most of the time from 1834 to 1991 and supply-leading for 1890-1934.

Al-Yousif (2002), who applies both a cross-country and a time-series approach in his contribution, also finds bi-directional causality to be the dominant, yet not the only observable pattern. Rousseau, Wachtel (1998) find evidence for supply-leading finance in USA, Canada, UK, Sweden, and Norway for the period of 1871 to 1929. Most other studies find very unstable causality patterns across countries and time. Overall, time-series studies concentrating on intermediation produce rather mixed pictures, as regards causality. Supply-leading patterns tend to occur somewhat more frequently than demand-following (Table 8).

Table 8: Time series studies: banking intermediation covered only

Authors	Year	Sample coverage: region	Sample coverage: time	Economic variable	Explanatory financial variables I: banking intermediation	Method	Investigated links	Major findings
Fritz	1984	Philippines	1969-1981	Variable composed from 7 output indicators	Composition from 10 monetary indicators;	Granger causality tests	Links & causality between financial deepening & economic development	Supply-leading 1969-1975 & 1975-1981
Gupta	1984	14 developing countries	Various periods between 1959-1980	Index of industrial production	M1; M2; M3; private credit	Granger causality tests	Links and causality between banking intermediation and industrial production in developing countries	Supply-leading in 8 out of 14 developing countries, bidirectional causality in 6 countries
Jung	1986	56 countries (no details available)	Various periods between 1950 and 1992	Growth of real GDP per capita	Cash/M2; M2/GDP	Granger causality tests	Links and causality between financial deepening, financial structure and economic growth	No general causality pattern; supply-leading more likely to occur in developing countries, demand-following more likely in developed countries (for cash / M2)
St. Hill	1992	37 developing countries	Various periods between 1950-1990	Real GDP per capita	Cash/M2; M2/GDP	Granger causality tests	Links and causality between financial deepening, financial structure and income in developing countries at different financial development stages	Supply-leading more likely in developing countries with lower financial development
Wood	1993	Barbados	1946-1989	Growth of real GDP	M2/GDP	Granger causality tests	Links and causality between financial deepening and economic growth	Falsification of Patrick hypothesis: demand-following 1946- 1986, supply-leading 1969-1990
Thornton	1994	9 Asian developing and transition countries	Various periods between 1951-1992	Real GDP per capita	M3/GDP; (M3-Cash)/GDP	Granger causality tests	Links and causality between financial deepening and economic growth	No general causality pattern

Continued: Time series studies: banking intermediation covered only

Authors	Year	Sample coverage: region	Sample coverage: time	Economic variable	Explanatory financial variables I: banking intermediation	Method	Investigated links	Major findings
Demetriades, Hussein	1996	16 countries (3EU+; 1 ACC)	1960-1995	Real GDP per capita	Bank deposit liabilities /GDP; bank claims on private sector /GDP	Granger causality tests	Causality between banking intermediation and economic growth	Little evidence for supply-leading, some for demand following; bi-directional causality for most countries
Hansson, Jonung	1997	Sweden	1834-1991	Real GDP per capita	Bank credit to non-financial sector per capita	Co-integration analysis and Granger causality tests (investment per capita as conditioning variable)	Co-evolution of banking intermediation and real income	Mostly unstable relationship between intermediation and output; supply-leading 1890-1934; positive influence of education on supply-leading pattern
Rousseau, Wachtel	1998	USA; Canada; UK; Sweden; Norway	1870-1929	Growth of real GDP per Capita	Money base; various proxies for intermediation based on bank deposit and credit	Granger causality tests (VAR framework)	Links and causality between banking intermediation and economic growth	Supply-leading in early phase of economic development
Al-Yousif	2002	30 developing countries	1970-1999	Growth of real GDP per capita	M1, M2 / GDP	Granger causality tests in error correction model (for panel data analysis see overview 1)	Links and causality between banking intermediation and economic growth	Strong evidence for bi-directional causality; limited evidence for other patterns; for further additional results see overview 1

2.3.5.3.2 Time-Series Studies Covering Intermediation and Securities

Time-series analysis covering both banking intermediation and stock markets provide some particularly heterogeneous evidence on the links between the financial and the real sector (Table 9). Demetriades (1997) applies Granger causality tests to Germany and the USA, whereas the former country shows supply-leading finance, no uni-directional causality pattern can be found for the latter. Neusser, Kugler (1998) use financial sector GDP of 13 OECD countries from 1960 to 1997 as an explanatory variable and find the whole range of possible causality patterns, varying across countries and time. Shan, Morris, Sun (2001) find demand-following, supply-leading, and mostly bi-directional evidence.

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Table 9: Time series studies: banking intermediation and securities covered

Authors	Year	Sample coverage: region	Sample coverage: time	Dependent variable	Explanatory financial variables I: banking intermediation	Financial variables II, securities	Method	Investigated links	Major findings
Arestides, Demetriades	1997	USA; Germany	1979-1991 (quarterly data)	Real GDP per capita	M2/GDP (Germany); domestic bank credit / GDP (USA)	Stock market capitalisation / GDP; Stock market volatility (16-month standard deviation of share prices)	Granger causality tests and system exogeneity analysis	Links and causality between financial sectors and economic growth	Cross-country analysis oversimplifies results; links between financial sectors and growth are different in Germany and USA: causality from financial to real sector for Germany; no evidence for unidirectional causality for USA
Neusser, Kugler	1998	13 countries (13 EU+)	1960-1997	GDP of manufacturing industry (MGDP); total factor productivity of manufacturing industry (MTFP)	Financial sector GDP (FGDP)	Financial sector GDP (FGDP)	Granger causality tests	Causality between financial sector and growth	MGDP and FGDP are co-integrated in 7 countries; MTFP and FGDP are cointegrated more often; evidence for causal relationships from the financial to real sector only for USA, Japan and Germany; and evidence for the inverse direction in some other countries; no evidence for causal relationships in small countries
Shan, Morris, Sun	2001	10 countries (6 EU+; 0 ACC; China)	1960-1998 (maximum time span); 1982-1998 (minimum time span)	Growth of real GDP per capita	Bank credit / GDP (bank credit = loans by commercial banks and other deposit-taking banks)		Granger causality tests (VAR framework) with conditioning set	Links and causality between banking intermediation and economic growth	5 countries show bi-causality, 3 demand-following, 2 no causality

2.4 Summary of Empirical Evidence

The possible relations between the financial and the real sector can be categorised by the following five basic hypotheses as alluded to in this section:

- no causal relation
- demand-following
- supply-leading
- negative causal link from finance to growth
- interdependence

Hypothesis (1) appears to be falsified by the majority of empirical studies under review. Evidence for the existence of some kind of relationship between finance and growth is high. Hypotheses (2) and (3) have been tested by a number of time-series studies, distinguishing between different countries and different time periods. Both supply-leading and demand-following patterns have been observed. The evidence found, however, is strikingly heterogeneous in both the regional and the time dimension. To date we have little insight in which factors cause the different causality patterns observed. Further research is necessary to solve this issue.

2.5 Conclusion

The exact nature of the relationship between finance and growth has been the subject of heated debates for many years. Consequently, many models and empirical studies have been proposed to shed light on this issue. One strand of this literature investigates the positive link between financial sector and economic growth while the other investigates the causal relationship. This section is part of that literature.

The approach taken to investigate the link between the financial sector and economic growth focused on the role of the financial sector in promoting growth from the African point of view and then broadening it on international studies. It is motivated by the scant empirical evidence that prevails in Africa on this important issue. Empirical research on the links between finance and growth in Africa is still limited. However the existing evidence seems to suggest that financial market development is positively related to the growth rate of income. Research is constrained by lack of detailed information that can allow one to assess the extent to which financial sector systems affect growth.

Secondly, it is clear from the few empirical studies on the African continent that the evidence of the issue of causality is at best mixed with no clear cut results supporting one hypothesis. Furthermore, as seen from the trends and patterns of financial development in literature so far, it would be expected that the result would be a distortionary rather than a promoting effect of financial markets on regional economic development. Empirical studies on this issue for SSA have yielded mixed results which are discussed in section 2.2.6. Evidently, some studies suggest that financial factors have enhanced economic growth in the past, e.g. by positively influencing the levels of investment or capital accumulation. Others find that the impact of financial development on growth has been rather negligible. The issue of finance-growth causality is by far not settled. This is supported by the empirical studies of: Ghirmay (2004), who finds strong evidence of a virtuous circle between financial development and economic growth. Also Atindehou *et al.* (2005) whose results indicate the opposite causal effect between finance and growth, with finance and growth exhibiting only a weak causal relationship.

Two issues come out from this review: (1) that most studies which have been done on the African continent are based on cross-country or panel regression, (2) that the few countries conducted on a country specific level appear to be misspecified in that only two or three variables are included in their models and therefore may suffer from omission of variables and in that regard may be invalid.

Chapter 3

Financial Sector Development in the Study Countries

3.1 Introduction

The financial development in the three study countries differs from country to country and over time. The banking sector in South Africa is well developed but concentrated, with the five largest commercial banks – Standard Bank of South Africa, Nedbank, Amalgamated Banks of South Africa (ABSA, now majority-owned by Barclays Plc), First Rand Bank and Investec Bank – holding over 86% of the banking sector's assets. There are 18 registered banks, two registered mutual banks, 15 registered branches of international banks with combined assets of approximately ZAR 2 trillion. The sector also has 1,354 micro-finance institutions. Commercial banks are supervised by the South African Reserve Bank (SARB), whereas other financial institutions and the financial market fall under the supervision of the Financial Services Board (FSB). There is a trend towards closer co-operation with the insurance sector, with alliances developing between the major banks and insurance companies. Foreign participation in South Africa's banking sector is concentrated in corporate and investment banking (South African Reserve Bank Annual Report, 2005).

The Johannesburg Stock Exchange, formed in 1887, is one of the largest stock exchanges in the world by market capitalisation. The South African financial sector consists of the South African Reserve Bank, commercial banks, insurance companies, micro-lenders, the Development Bank of Southern Africa, the Land Bank, unit trusts, the Post Bank, and the Johannesburg Stock Exchange, among others. The South African Reserve Bank can be considered to be independent, even though there is some degree of consultation between the bank and the government. According to the South African Constitution (Act No. 108 of 1996), "The South African Reserve Bank, in its quest of achieving its primary objective, must perform the functions independently, but there must be regular consultation between the bank and the cabinet member responsible for national financial matters". The South African Reserve Bank relies entirely on indirect instruments of monetary policy, namely open market operations, reserve requirements, and credit facilities, amongst others. Although South Africa is considered to have one of the most developed and sophisticated financial systems in sub-Saharan Africa, its market share, as in the case of Kenya and Zambia, is still dominated by only a few financial institutions. By the mid-

1990s, for example, more than 95 per cent of the banks' total assets were held by only four banking groups, whilst the remaining 5 per cent were spread among 27 local banks, nine foreign-controlled banks, a few branches of foreign banks and some mutual banks.

Though not as sophisticated as the South African financial sector, the Kenyan financial sector is considered to be well developed, with a number of specialised financial institutions (see Legovini, 2002). By 2004, the financial system comprised 43 commercial banks, 2 non-bank financial institutions, 4 building societies, 75 foreign exchange bureaux, 2 mortgage finance companies, a large Post Office Savings Bank and a well-established Nairobi Stock Exchange, among others. Currently, there are about 41 commercial banks, 2 non-bank financial institutions (NBFIs), 2 mortgage finance companies and 89 foreign exchange bureaux, amongst others.

The Central Bank of Kenya has implemented a number of institutional and monetary policy reforms in order to increase competition in the financial sector and to strengthen its regulatory and supervisory roles. The amendment of the Central Bank Act in April 1997 gave the Bank greater monetary autonomy. Though required to support the general government economic policy, the Central Bank of Kenya has independence in exercising the powers conferred on it by the Central Bank of Kenya (Amendment) Act 1996. Although the financial sector in Kenya has undergone substantial financial and economic reforms over the last decade, the sector is still dominated by a few banks, just as in the case of South Africa. For example, by 1998 it was estimated that only nine banks controlled 70 per cent of the market share. This can be partly attributed to the financial distress in the 1990s when the number of commercial banks placed under the statutory management of the central bank increased fivefold: from one in 1994 to five in 1998.

Unlike South Africa and Kenya, the financial system in Zambia is still in its infancy. The system is mainly bank-centred. The financial deepening and widening has not reached the expected level. The financial market is underdeveloped and there is no significant development of leasing institutions, housing finance institutions, hire purchase and retail credit companies. The long-term lending sector remains underdeveloped with small and weak contractual saving institutions and a relatively small stock exchange (Lusaka Stock Exchange), which was only established in 1993 and became operational in 1994. As a result, money and capital intermediaries such as dealers, brokers and discount houses have not developed to the expected level (FSDP, 2004). The banking sector in Zambia is relatively small and less developed when compared to those of Kenya and South Africa. Before the financial reform of the 1990s, foreign owned banks

dominated the banking sector. This scenario has remained the same up to this day. In 1990s, the government implemented a number of policies in order to strengthen the development of financial institutions in Zambia. These do not seem to have yielded much result. Currently there are about 13 commercial banks, 14 micro-finance institutions, 10 leasing companies and 1 savings and credit bank. The rest of this chapter details the financial sector development in the three countries starting with Kenya, followed by South Africa and then Zambia.

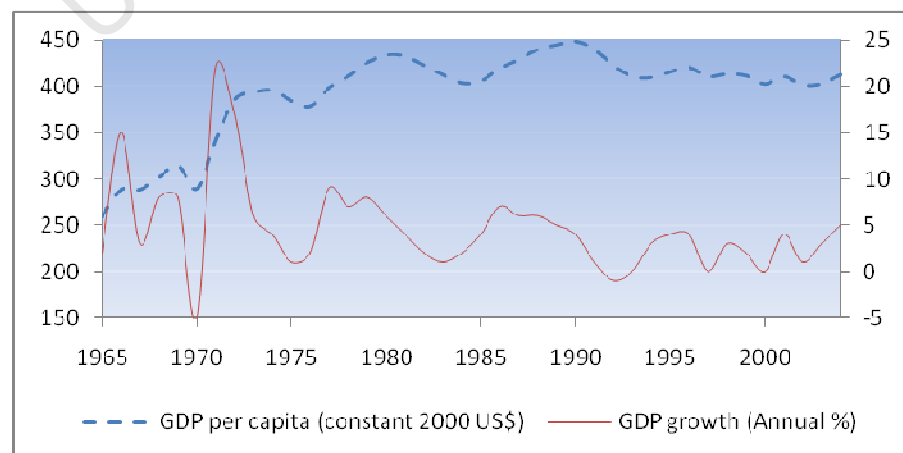
3.2 Kenya

Kenya, an east African country, has worked for economic stability since its independence from Britain in 1964. Despite efforts of government and central bank, the country remains in a pattern of external debt and domestic deficits, with sluggish gross domestic product (GDP) growth. This sluggish growth pattern, coupled with low domestic savings and repressed financial sector, has prevented Kenya from achieving the growth it has envisaged. The following section, discusses the sluggish macroeconomic trends, which characterise Kenya's position.

3.2.1 Macroeconomic Trends for Kenya

Kenya's gross domestic product (GDP) for 2003 was 1.04 trillion Kenyan shillings or 13.8 billion US dollars. Kenya's recent GDP growth can be characterised as sluggish at best and varying somewhat dramatically from year to year. In the 1960s and 1970s, GDP growth fluctuated significantly from 23 percent to minus 5 percent, the result of a variety of factors, including political independence from British rule, world oil shortages in the early 1970s, increase in world demand for coffee (one of Kenya's major exports) in 1976 and 1977, and the collapse of the East African Community in 1977.

Figure 1: Real per capita GDP & GDP growth (1965-2004)



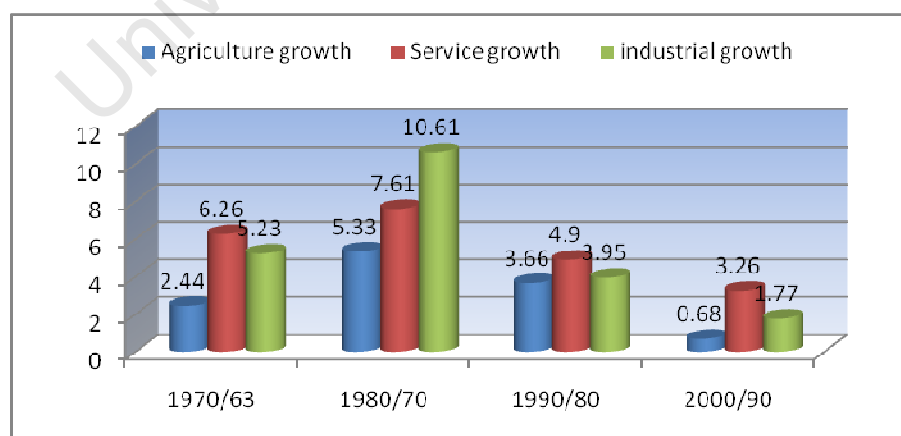
Source: World Development Indicators

(The EAC was an economic partnership among Kenya, Uganda, and Tanzania that failed due to ideological differences). Since 1980, Kenya's GDP growth has stabilised relative to the 1960s and 1970s but still shows marked variation from year to year. Within the past 15 years, GDP growth has mostly been below 3 percent (See Figure 1). This growth, while slow, is comparable to overall African GDP growth which has been between 3 to 4 percent for the past 10 years (IMF, World Economic Outlook).

While Kenya's economy has shown positive growth in recent decades, population growth has outpaced GDP growth, and the result is a declining per capita GDP and a declining standard of living. Figure 1 shows the trend in the resultant declining per capita GDP over those years. Population growth in Kenya has been relatively steady for the past 40 years, varying only from 2.5 percent to slightly over 4 percent during that time. Since the 1980s, population growth has been on a steady decline. Since fluctuations in GDP growth are the reason for periodic declines in Kenyan per capita GDP and, further, since population growth is largely out of the control of government policies, increased and steady GDP growth is the key to improving the standard of living in Kenya.

When the key drivers are segmented into three sectors (i.e., agricultural, service and industry) over the period 1963-2004, agricultural growth fell from 5 percent in the 1970s to less than 1 percent in the 1990s. In the industrial sector, output growth fell from a buoyant 11 percent in the 1970s to a mere 4 and 2 percent in the 1980s and 1990s respectively. Growth in the service sector where financial sector is included declined as well from 8 percent in the 1970s to 5 and 3 percent in the 1980s and 1990s (Figure 2).

Figure 2: Growth by sector

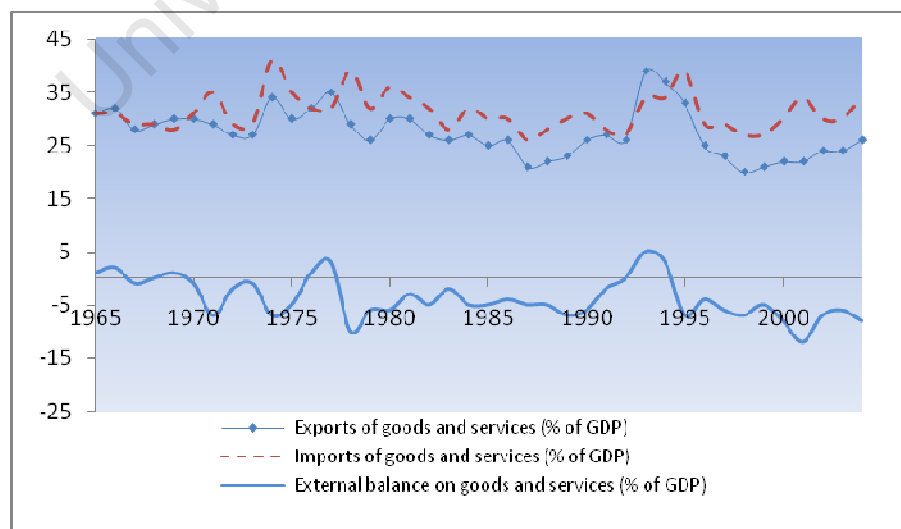


Source: IMF

The relatively stronger performance of the service sector affected the composition of the economy. Between 1963 and 2000, services gained share from 44 to 60 percent of value added while the share of agriculture fell from about 38 to only 23 percent (Figure 3 Composition of Value Added). Employment in agriculture dropped accordingly from 87 percent of the labour force in 1963 to 77 percent in 1999.

The growth rates experienced in the 1970s were the result of a combination of favourable factors. In agriculture, the newly independent government had successfully distributed productive land to small farmers and promoted the cultivation of cash crops such as tea, coffee, and hybrid maize and the development of dairy farming. As a result of this and good market conditions, rural incomes rose by 5 percent a year from 1974 to 1982, and the smallholders' share of coffee and tea production rose to 40 and 70 percent respectively in the early 1980s, as did the varieties of maize produced (Swamy, 1994). In the 1963-1980 period, sustained commodity exports provided foreign exchange earnings, which favoured investment and capital imports (Figure 3). In industry, a mutually benefiting alliance between business and the body politic provided the rationale for implementing an industrial strategy based on import-substitution. The approach afforded high barriers to entry to importers and disincentives to export growth. It delivered high growth rates for the sector in the first years of implementation even though it relied too heavily on capital intensive technology to provide for the growth in employment policymakers had hoped for. It also set the basis for an inefficient and rent seeking industrial sector.

Figure 3: External Balance for Kenya

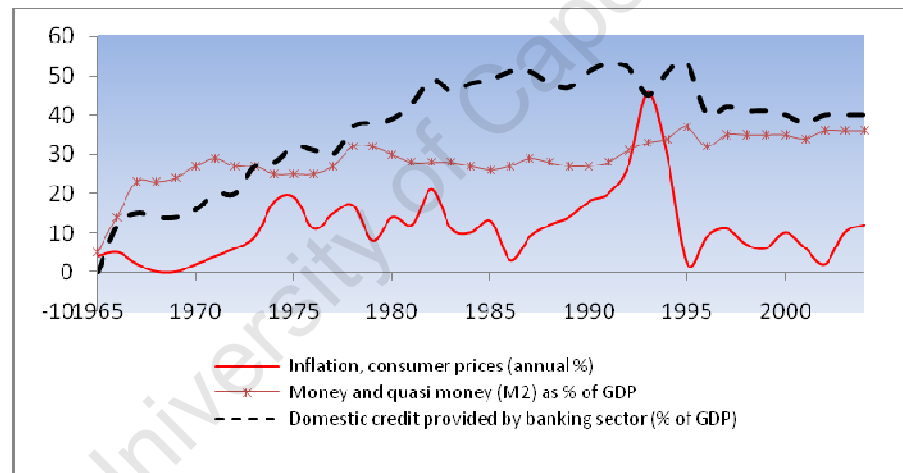


Source: World Development Indicators

Starting in the early 1970s several factors started to negatively affect Kenya's growth potential. Among them a series of trade shocks, poor macroeconomic responses, and a change in the structure of the economy in which the government started to become an increasingly dominating force.

The government expanded largely. Its expenditures increased by 60 percent in 1972-94. The fiscal imbalances that accompanied the expansion put pressure on domestic credit and inflation. Domestic credit provided by the banking sector expanded from 12 percent of GDP in 1966 to a peak of 56 percent in 1992. Money and quasi money swelled from a low 27 percent of GDP in 1988 to a high 45 percent in 1997, an election year. And, from a low average of 5 percent in the 1960s, inflation fluctuated between 10 and 20 percent annually from the mid-1970s to the mid-1980s, and accelerated further in the 1990s reaching a peak of 46 percent in 1993 (CPI) (Figure 4).

Figure 4: M2/GDP, Commercial Bank Credit/GDP & Inflation



Source: World Development Indicators

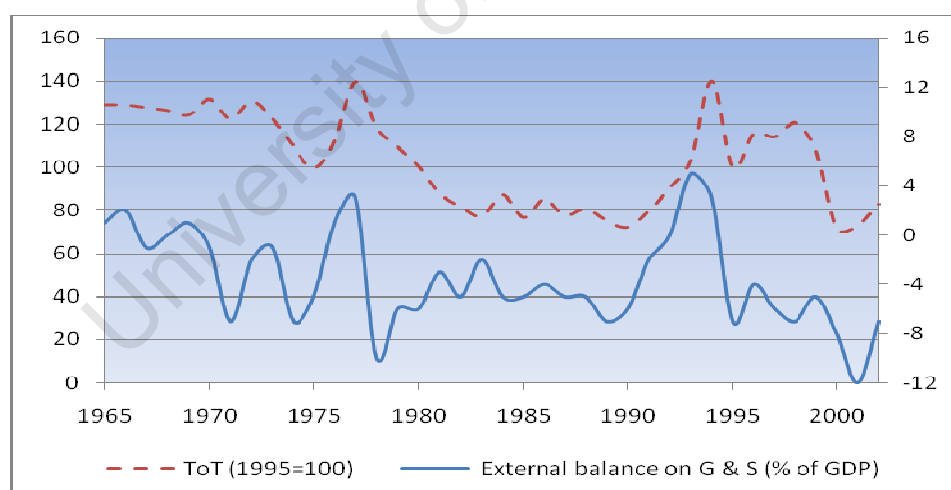
Changes in the structure of the economy were set off by a rapidly expanding state-owned enterprise sector. Involved in manufacturing, financial services, and processing and marketing of agricultural products, it engendered distortions and inefficiencies. Large financing requirements of parastatals, combined with favouritisms from the state-owned banking sector crowded out private sector production and investment. The absence of productivity gains in the state-owned enterprise sector significantly lowered productivity gains in the economy overall. Furthermore the oligopolistic industrial structure nurtured by state-owned enterprises and import substitution

policies increased inefficiencies and decreased the economy's capacity to adjust to changing external conditions.

Policy response was also weak (Njunguna, 1994). When the natural market afforded by the regional customs zone with Uganda and Tanzania broke down in 1977, Kenya failed to implement the needed policy shift towards a more export-oriented approach. Instead, it continued to protect local business. Even weaker was the response to the oil crises.

The rapidly deteriorating terms of trade of the 1970s led to the balance of payments crises of 1974 and 1978-80. With the first oil shock the terms of trade fell 24 percent (1972-75); rose 41 percent in the next two years with the coffee boom; dropped again 28 percent with the second oil shock; continued falling all through the 1980s another 30 percent; and finally improved to pre-shock levels by 1994 and thereafter (Figure 5). The external balance followed a similar pattern, falling in the red during the first oil crisis, recovering during the coffee boom, and falling again in the aftermath of the second oil shock. The deficit in the trade balance has persisted to the present with the exception of 1994, the year after the 81 percent devaluation of the Kenyan Shilling (Figure 5).

Figure 5: Terms of Trade & external balance

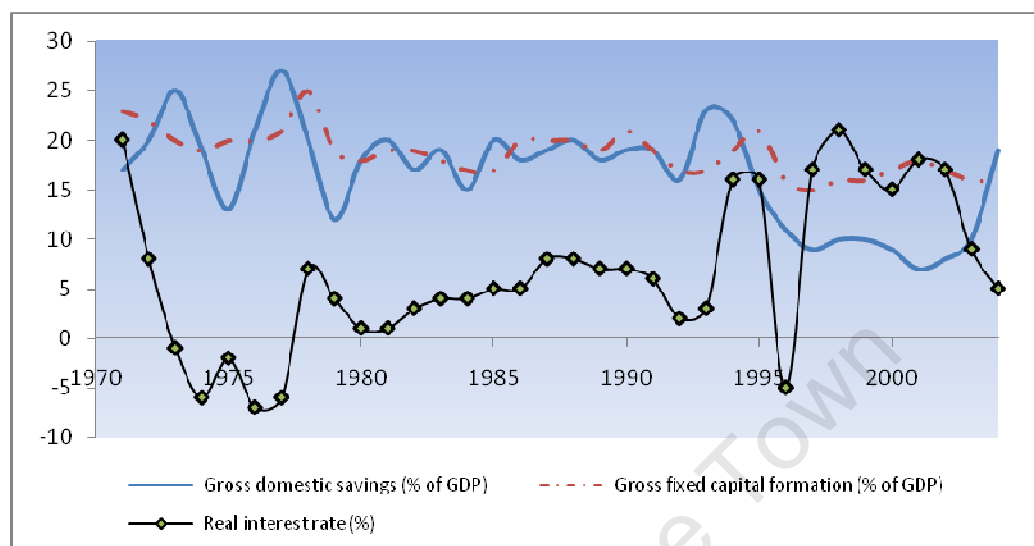


Source: World Development Indicators

The government reacted to the crisis by imposing controls on bank lending, licenses on foreign exchange transactions, import quotas, and price and interest rate controls. While restrictions on domestic credit were later lifted, the others were made even more stringent. These generated important distortions on economic activity and gave rise to pervasive rent seeking (Durevall and

Ndung'u, 1999). Real interest rates were negative from 1974-78, and domestic savings plummeted in 1975 and 1979 and never fully recovered (Figure 6).

Figure 6: Real interest rate, Gross Fixed Capital formation & Domestic Savings

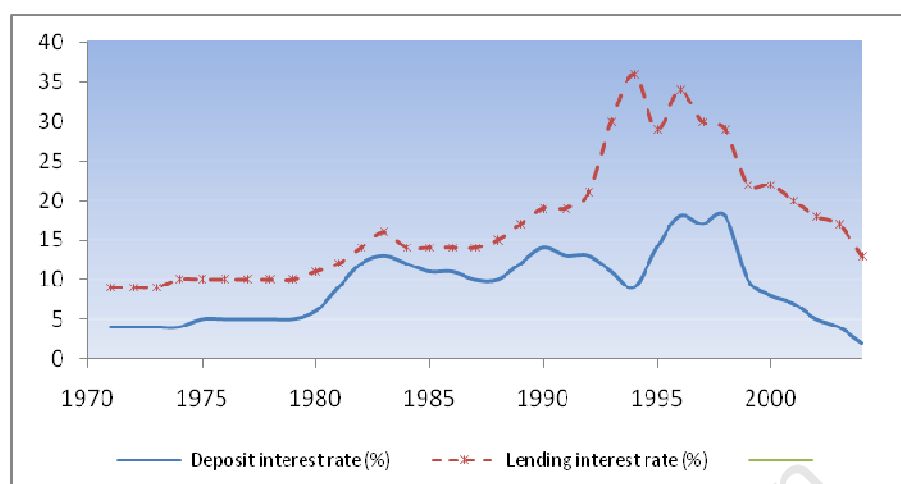


Source: WDI, World Bank

The coffee boom of 1976-77, while easing the economic crisis, was used to delay the necessary economic adjustment. Both fiscal and monetary variables expanded rapidly, and so did state-owned enterprises. Government expenditures rose by 37 percent in the two years between 1977 and 1979. Money (M2) grew 18 percent and domestic credit 23 percent in one year (1978/77). Investment of state-owned enterprises rose a stunning 14 percentage points of gross domestic income between 1978 and 1982 (from 17 to 31 percent), adjusted downward after 1982 and climbed back to 31 percent by 1990.

As state-owned banks financed low-productivity public investments, investment efficiency fell. Returns on public investment averaged a meagre 0.2 percent as compared to a 15 percent return on private investments (GoK, 1982). Real interest rates followed an upward trend from 1978 onwards and so did interest rate spreads reflecting the higher levels of uncertainty in the economy, the increasing number of non performing loans and low investors' confidence (Figure 7). Domestic savings declined from a high of 27 percent of GDP in 1977 to a low 7 percent in the year 2001 (compared to about 15 percent average in sub-Saharan Africa). Gross fixed capital formation (% of GDP) followed a similar trend by falling from a high of 25 percent in 1978 to 15 percent in 1997 (Figure 6) and rose slightly thereafter to an average of 16.6 percent between 1998 and 2004.

Figure 7: The Interest rate spread for Kenya (1990-1995)



Source: World Development indicators

3.2.2 Structure of financial sector

During this period Kenya financial sector had 21 commercial banks which were dominated by 5 big banks with approximately 69% of total commercial bank deposits. These five banks were the most important mobilisers of financial savings. In the 1970s and early 1980s, the growth of NBFIs was rapid, from 11 in 1976 to 35 in 1984, of which 15 were owned by commercial banks. The impetus behind this growth was clearly a favourable differential in interest rates that the NBFIs could pay on deposits, which at the time was effectively about 3%, above what the commercial banks were paying.

The expansion of NBFIs and the differential regulatory environment attracted deposits away from commercial banks, especially the parastatal deposits. This contributed to the segmentation of the financial market. Four large banks operated as a “gentleman’s club” retaining strong ties to multinationals and adhering to conservative lending practices (Swamy, 1994). In addition, the operations of government-owned DFIs, which provided equity and term loans to industrial enterprises, had further negative effects on the financial markets (World Bank, 1992). First, they worsened the segmentation of the financial markets. Their activities, characterised by low funding costs, large spreads and high arrears, made the commercial banks even more reluctant to provide lending. Second, the DFI sector was heavily subsidised from the central government and represented a significant drain on budgetary resources due to the institutions’ poor performance.

At the time the financial sector was being threatened by three issues (GOK, 1984). First, the budget deficits were increasing tremendously and the public sector was thus taking a large

proportion of available credit away from the financial system. For example, the public share of credit from domestic financial institutions increased from 29% in 1979/80 to 43% in 1981/82; by 1987, this share had increased to 47% (see tables 10).

This increasing crowding out of private sector borrowers by the public sector led to the rationing of credit to the private sector, with less favoured borrowers getting less of their credit needs. Even by the late 1980s, the position had not changed. Empirical work by Killick and Mwega (1993) showed that an increase of Ksh1 million in the banking system credit to the public sector would result in a Ksh0.36 million reduction in credit to the private sector. This portrays high levels of crowding out and is consistent with the indicators in Table 10.

Table 10: Macroeconomic Indicators, 1975-1980

Period	DC public	DC private
1975	33	67
1976	33	67
1977	28	72
1978	27	73
1979	29	71
1980	25	75
1981	33	67
1982	43	57
1983	39	61
1984	39	61
1985	38	62
1986	44	56
1987	47	53
1988	41	59
1989	36	64
1990	43	57
1991	42	58
1992	35	65
1993	33	67

Source: IFS, Central Bank of Kenya, Statistical Review and Economic Surveys

Second, the capacity of the system to provide long-term local currency finance for productive investment in the form of equity and term loans had been declining. The problem was diagnosed as both policy and institutional weaknesses (GOK, 1984). From the institutional side, the DFIs were financially weak because of poor portfolios while the markets for equity and debt securities were undeveloped. On the policy side, the short-term lending rates were higher than the long-term rates, which made it unattractive for financial intermediaries to provide long-term loans.

Third, the rapid growth of NBFIs led to the creation of financially weak deposit taking institutions that could (and did) collapse under financial pressure and shake public confidence in the financial system. Furthermore, the bulk of deposits in these institutions were from government owned corporations (parastatals). Any policy changes in the parastatals or the government could trigger an out-flow of deposits. The consequence of these factors was that the commercial banks provided short-term finance, mainly overdrafts, because they obtained the bulk of their funds through short-term deposits. The end result was a financial system oriented towards the provision of short-term finance (GOK, 1984).

As the expansion of the NBFIs thrived on deposits from the parastatals, the 1984-1989 Development Plan set out to change the operating environment (Ndii, 1996). The plan noted that the expansion of the small banks and the NBFIs emanated from an increase of parastatal and trust fund deposits, which grew from 12.1 percent in 1980 to 22.3 percent in 1984 (Table 11). On the other hand, the ratio of NBFIs deposits to commercial bank deposits increased more than two-fold in the same period, indicating a growing competition for business between the institutions. This growth difference was attributed to weaknesses in the regulatory framework, where NBFIs were subjected to less stringent controls compared to commercial banks. NBFIs were not subjected to the statutory reserve requirement and were allowed to lend at higher deposit rates compared to commercial banks (Ngugi, 2000).

Table 11: Financial sector development during reform era (1990-1996)

Period	Commercial bank assets/ GDP (%)	NBFIs Assets/GDP	NBFIs deposit/commercial bank deposits
1980	28.1	12.1	34.7
1981	27.6	12.9	36.3
1982	27.4	14.6	39.0
1983	25.4	21.8	45.5
1984	25.8	22.3	54.8
1985	25.2	21.9	57.1
1986	28.1	19.0	52.1
1987	28.9	13.6	52.6
1988	26.6	13.9	55.7
1989	27.1	14.5	56.6

Central bank of Kenya, statistical review

The plan noted that the assets were higher in the NBFIs than in the commercial banks and thus questioned the policy of differential returns (market segmentation in general). This reflected a policy shift and parastatals began to move their deposits from NBFIs this was the beginning of

the 1986 confidence crisis in the financial sector. The collapse of some banks and NBFIs caused a panic in the financial sector and deposits shifted to the large banks. Thus the crisis emanated from the weaknesses in the policy formulation; the situation further strengthened the monopoly of the large banks and did not help improve financial sector development.

The report on financial and money markets in Kenya (GOK, 1984) argued that one of the priority areas for development of Kenya's financial system was the securities market. A developed securities market would improve the allocative efficiency of savings mobilised for investment. At the time, the situation in practice was that the issue of new equity and debt securities by business firms was controlled by the government through a capital issues committee set up under the Ministry of Finance in 1971. Due to this control and the fact that the stock market had no legal framework to enforce its operations, business firms rarely raised capital through public issues of equity and debt securities. The main sources of local equity and new investments were retained earnings, group or family savings, direct government investment, and development banks. For debt financing, firms relied to a large extent on direct borrowing, largely through overdrafts from banks and other financial institutions.

A secondary market trading in long-term securities was operated by six stockbrokerage firms based in Nairobi. A private association of these brokerage firms, formed in 1954 under the Kenya Cooperative Societies Act, is now the Nairobi Stock Exchange (NSE). For a long time, until 1989, the stock exchange had no physical trading floor and was not regulated by specific securities legislation or a securities commission. The stock exchange operated according to rules and regulations adopted by the members in 1954 and amended in 1981.

It was against this background that the government, with the help of the World Bank, undertook financial sector reforms under the package of structural adjustment. But again there were policy errors. Interest rates were liberalised in 1991, in complete disregard of the pre-conditions necessary for successful financial sector reforms according to Montiel's (1995) four-step liberalisation sequence:

- Restore macroeconomic balance together with restructuring or liquidating ailing financial institutions;
- Introduce indirect monetary instruments with freely determined interest rates together with establishing supervisory capacity of the central bank on the financial system;

- Foster competition in the banking sector, by encouraging more domestic and foreign banks and reducing government shareholding in the financial sector;
- Liberalise interest rates and remove all forms of administrative controls on the financial sector.

In addition, successful reform requires that the government maintain the following conditions: an appropriate legal framework; well established property rights and an efficient judicial system; a financial safety net to avert a liquidity crisis; an adequate regulatory and monitoring framework to prevent collusion and excessive risk taking due to moral hazard problems; a potentially successful borrowing class and Fiscal adjustment.

The above preconditions relate to both institutional and macroeconomic reforms. It is not surprising that in the assessment of the Financial Sector Adjustment Credit (FSAC), the World Bank (1992) argued that in a vastly under-regulated and under-supervised financial system, interest rate liberalisation came too early. This encouraged over competition in the financial system and encouraged weak financial institutions to invest in riskier assets, thereby adding to their difficulties (World Bank, 1992). The ensuing legislative reform measures had little impact since even though the technical capacity of the supervisory department of CBK was improved, political forces weakened enforcement. It was estimated that 11 banks and 20 NBFIs were in financial distress in 1992 (Swamy, 1994).

3.2.3 Direct Controls in Kenya

Financial repression in Kenya dates back to the 1960s, after independence. At independence, Kenya inherited a financial system composed of East African Currency Board (EACB) and commercial banks dominated by foreign banks. These banks concentrated mainly on short-term commercial and trade finance with few branches to serve the country (Ngugi and Kabubo, 1998). To ensure that resources are allocated in line with the development strategy, the government opted for direct participation in the banking system.⁷ Against this background, new institutions were established to collect savings and financial investment. Among the financial institutions established were the Development Finance Institutions under the ownership of the government. Banks were also directed to lend to priority areas such as agriculture and small scale business.

⁷ One of the objectives of development strategy at the time was to “nationalise” the economic management, and develop areas that had been neglected during the colonial era.

Apart from the ownership the government other controls were initiated and these included: control of interest rates and selective credit allocation schemes. These monetary controls were implemented through liquidity asset ratios and cash reserve ratios which were imposed on the commercial banks and the NBFIs, and through credit ceilings imposed on commercial banks based on historical market share of each institution. The central Bank of Kenya also set minimum deposit and maximum lending rates of interest for both commercial banks and NBFIs (Killick and Mwega, 1990). Real interest rates for both deposits and loans were negative during the 1970s, but after nominal rates were raised in 1982, real loan and time deposits remained higher than inflation throughout the rest of the decade.

Despite these efforts, the financial sector that developed between 1963 and 1986 was in many ways unsatisfactory for the efficient development of the economy. It was not capable of generating adequate amounts of equity and long-term debt finance for private projects in all sectors of the economy. Interest rates were controlled in the commercial banks, treasury bill rates were set by the government, there was no real secondary market for the treasury paper and the capital market was biased towards loan finance rather than equity (GOK, 1984). Government paper was composed of short-term 90-day treasury bills and long maturity bonds with very low rates. The short-term securities dominated by government paper did not effectively serve the private sector. There was thus no continuum between the money and capital markets and the rates of return did not reflect the true cost of capital (Mullei, 1995).

The banking sector was dominated by four large banks with a long tradition of working together rather than of aggressive competition. This hampered the conduct of monetary policy since more indirect policy instruments could only be expected to work well in a context of competitive banking and financial systems (Killick and Mwega, 1993). The DFIs developed by the government to channel capital to emerging entrepreneurs effectively failed. They were hampered by portfolio weaknesses and could not raise domestic funds, particularly for equity. The Banking Act was not particularly effective in controlling under-capitalised financial institutions.

The origin of the non-bank financial institutions (NBFIs) can be traced to the policy environment in the 1970s. The government policy at that time was to encourage specialised institutions for the collection of savings and the financing of investments. These institutions thrived and expanded tremendously due to three factors. First, the Banking Act of 1968 eased entry requirements into the banking sector for indigenous entrepreneurs by setting low share capital requirements. The share capital minimum requirements were categorised for indigenous

NBFIs and commercial banks and foreign NBFIs and commercial banks. This bias was further reinforced in subsequent modifications and amendments in the 1980s. Second, controlled interest rates in force during the 1970s and 1980s favoured the NBFIs over the commercial banks. Finally, the NBFIs and the small indigenous commercial banks thrived on parastatal deposits, particularly deposits from the National Social Security Fund and the National Hospital Insurance Fund. As such, they enjoyed a preferential policy environment but were also vulnerable to any policy change regarding these deposits. These factors ensured a tremendous growth in the NBFIs.

Thus, during the 1970-1983 period, the government licensed new banks and NBFIs in an effort to increase local Kenyan participation in the financial system (World Bank, 1992). The NBFIs were not subject to statutory reserve requirements and were allowed to lend at higher rates than the commercial banks. As a result, NBI assets tripled during 1980-1985, from Ksh6.5 billion to Ksh19 billion, while commercial bank assets doubled over the same period. This expansion of the NBFIs outstripped the ability of the central bank to supervise their activities effectively. There was also the argument that the economy was “over banked”.

The ensuing amendments to improve Central Bank of Kenya (CBK) surveillance caused the commercial banks to expand into NBFIs in order to avoid more stringent requirements. These NBFIs were also undercapitalised and overexposed. An increasing proportion of deposits were being placed with them since they were not subject to controls on interest rates or credit. The effectiveness of monetary policy was thus weakened. The stock market, for its part, operated as an informal club with no protection and no laws to prosecute insider trading (Mullei, 1995).

3.2.4 Effects of Government Intervention on Financial Sector System

Although government intervention in the financial system had been extensive, Kenya had managed to avoid some of the most damaging features of the financial repression that characterised several other countries in the sub-Saharan countries, and this is reflected in the expansion of the financial sector system in terms of volume of both liabilities and assets and the diversity of its institutions over the three decades since independence (Brownbridge, 1998). Whereas in 1966 the broad money to GDP ratio was 22.9 percent, this figure improved to 38.3 percent in 1992. The same happened to the liquidity liability of banking system which saw the figures improving in 1966 to 50.6 percent in 1992 (see Table 12). Despite the interest rate ceiling, interest rates were not sufficiently unattractive to the investors and this was largely due to inflation rates which were modest. Against this background, the prevailing interest rates

did not prevent Kenyans from acquiring the assets in the financial sector system and in turn this led to the provision of resources for financial intermediation in the banking sector.

Table 12: Financial Indicators (1966-1992)

Year	1966	1970	1975	1980	1985	1990	1992
M2/GDP	22.9	30.4	28.6	30.6	26.7	29.7	38.3
Liquidity/GDP			33.8	38.8	39.1	43.3	50.6
Banking system claims on public sector	0	1.2	9.1	9.1	15.2	15.9	11.3
Banking system claims on private sector	12.8	15.1	21.8	30.2	31.5	32.8	30.2

Source: IMF, IFS and World Development Indicators

Public sector deficit was large, but access to foreign capital, together with the size of the domestic financial sector system helped to ensure that private borrowers were not crowded out of the domestic credit market. As a result credit advanced to the private sector system by the commercial banks during the 1970s averaged 76 percent of the net domestic credit and 59 percent during the 1980s.

Furthermore, because the repression of the financial sector system was not so severe, few of the private sector financial institutions had the quality of their financial assets compromised or profitability impeded through direct controls of allocation of credit to government preferred institutions. However, apart from Kenya Commercial Bank, government intervention into the financial sector system had contributed to poor performance of many other financial institutions and in particular DFIs.

3.2.5 Deregulations in Kenya

The period 1980-84 marked the first and failed attempt at economic adjustment: partly because commitment to reform was limited to a few top civil servants, the government failed to carry out trade reforms and liberalise grain marketing. Broader consensus was achieved during a second period of adjustment in the second half of the 1980s and some trade liberalisation measures were successfully put into place. Not so for agricultural reforms that lagged severely behind. Implementation remained weak and commitment uneven. One major flaw was that structural adjustment took place within an environment of severe fiscal laxity (Swamy, 1994). The beginning of the 1990s marked a third wave of reform when interest rates were liberalised and exchange rates allowed to float. Fiscal adjustment followed in the 1994-1999 period. Limited

progress was also made in reducing government intervention in the economy by privatising state-owned enterprises, and liberalising agricultural markets.

3.2.5.1 Financial Policy Reforms

Kenya has a fairly well developed banking system that comprises 47 banks, 5 non-bank financial institutions, 4 building societies and 47 exchange bureaus. The four largest banks hold 55 percent of gross assets and deposits (IMF, 2002b). Two of these banks are foreign-owned and private and two are local and partially government-owned. Since its creation in 1982, banking supervision has been under the responsibility of the Central Bank of Kenya (CBK). Prudential regulation has traditionally been weak but has been strengthened in recent history. However, regulatory enforcement is lacking and continued political interference in the court system hinders efforts of banks and liquidators to resolve lending and contractual disputes. The Capital Markets Authority controls licensing and supervising of brokerage, asset management, rating and other capital market institutions.

As discussed in the previous sections, financial controls and political interests distorted banking in Kenya. The ‘political banks’ were local institutions founded by the business and political elites to exploit contacts in parastatals to enlarge their deposits and engage in murky development schemes. Furthermore, development finance institutions were set up by the government in the 1960-70s, which specialised in lending to particular sectors. Among them was the Agricultural Credit Corporation. Without exception, poor portfolio decisions rendered these institutions unprofitable and financially unsustainable.

Initial reforms in the banking sector in the early 1980s responded to the concern that foreign owned banks had a majority share in the Kenyan market. Financial institutions proliferated as licensing requirements were relaxed. Lack in uniformity in banking regulation across different types of institutions allowed near bank financial intermediaries to avoid interest rate ceilings and attract deposits from commercial banks by offering higher deposit rates. In 1986, poorly enforced regulations on capital and reserve requirements resulted in the failing of four commercial bank groups that owned large near bank financial intermediaries (Swamy, 1994). By 1989, many more financial institutions were on the brink of failing.

To facilitate reforms, the banking Act was amended in 1989. In addition to strengthen the Central Bank’s regulatory and supervisory roles, other areas affected by the amendments included: introduction of stricter licensing requirements of financial institutions, increasing the

minimum capital requirement, the establishment of the deposit insurance funds, new guidelines for granting loans and minimum disclosure requirements, and increasing penalties for non-compliance.

Nevertheless, enforcement of the banking regulations even after the amendments of the Banking Act continued to be hampered by political forces, leading to a new banking crisis in 1986 when two banks and twenty NBFIs faced liquidity problems. Thus, reforms in the later part of 1980s and early 1990s emphasised tight credit controls to suppress inflation. This was achieved in part through adjustment of cash ratio requirement for commercial banks and raising of interest rates. The political factors seem to have persisted and in 1989 several banks and financial institutions were in crisis and placed under statutory management control while others were liquidated.

The financial reforms that followed in 1990 were aimed at removing all charges and fees from the ceiling of commercial bank rates, which allowed the effective interest rate to exceed the ceiling. In 1991, the auction market for government bills and bonds was established. Still the government arranged most transactions directly with financial institutions to try to minimise interest payments (Swamy, 1994). These arrangements impeded the development of secondary markets for government paper. Other reforms included the establishment of a cash reserve ratio and the imposition of liquidity ratios on commercial banks and other financial intermediaries. In 1999, prudential regulation was strengthened to safeguard against major risk activities of the banks and capital requirement for financial institutions raised from KSh 75 million to KSh 300 million, effective January 2002, and KSh500 million, effective in 2005 (IMF, 2002b).

To date, the restructuring of the banking system and the establishment of a strong regulatory enforcement mechanism remain on the unfinished agenda. As a result, the banking system remains fragile and vulnerable to the extremely high and growing ratio of non-performing loans (41% in 2001 up from 25% in 1998 and 20% in 1997) (IMF, 2001b). These loans are held predominantly by public banks, which have traditionally given credit priority to parastatals, irrespectively of sound financial practice. Public banks display a level of unprovisioned non-performing loans equal to 260 percent of equity capital. This is one of the factors behind high real interest rates. The restructuring of these banks remains an issue. In addition, the segmentation of the market where large banks cater to multinational concerns and state-companies to public lending perpetuates rigidities and inefficiencies in the allocation of credit.

3.2.5.2 Foreign Exchange Reforms

Kenya has in recent past undertaken significant reforms of foreign exchange markets with a view to removing exchange controls on most current account transactions as well as the capital account. Imports and foreign exchange allocation licenses have been abolished, except for a small negative list for security and health reasons, and most restrictions on foreign direct investment eliminated. Kenya has acceded to Article VII of the IMF Articles of Agreement, whereby all transactions on the current account are free of controls. However, foreign participation in the Nairobi Stock Exchange has not yet been fully liberalised.

Kenya has also progressively moved to market determined exchange rates. Exchange rates are determined by the interbank market for foreign exchange and the Central Bank of Kenya intervenes only to buy whatever foreign exchange it needs to buy for its own use or that of the Government to service external debt. Accordingly, determination of the exchange rate of the Kenya shilling has been fully liberalised. More recently, in order to enhance the convertibility of the Kenya shilling, Kenya, Tanzania and Uganda have agreed to make their currencies convertible into each other. Thus the currency of each country can be quoted in the financial markets of the other.

The shift to market determined exchange rates has, however, not been without problems as the value of the Kenya shilling oscillated from one end to the other depending on developments both at home and abroad. However, the currency now appears to have stabilised around Ksh 55.0 to US\$ 1.0.

3.2.5.3 Bank Interest Rate Reforms

Kenya has progressively moved towards market determined interest rates. This process started in late 1980s with ceilings on deposit interest rates being adjusted upward periodically and ceilings on lending rates of commercial banks being moved closer to those charged by non-bank financial intermediaries. These changes progressively led to harmonisation of interest rate structure in Kenya.

The most notable development in the process of moving towards market determined interest rates occurred in 1990 when the Central Bank of Kenya removed the requirement that ceilings on loan interest rates had to include any levies and charges imposed by commercial banks. This allowed effective interest rates on loans to significantly exceed the ceilings. Kenya has at present attained full liberalisation in the determination of interest rates, as these are now determined in

financial markets. Commercial banks and non-bank financial intermediaries are now free to set their own interest rates based on demand and supply for financial resources.

Kenyan monetary authorities are of the opinion that despite the diversity of the Kenyan financial structure and the large number of institutions, the country's financial sector is far from being competitive. This is reflected in the 'wide spread' between deposits interest rates and lending rates; which at times have been as much as 12 percentage points. The authorities argue that a few major commercial banks continue to dominate the financial sector.

The management of commercial banks argue, however, that interest rates spreads in Kenya reflect to a large extent the following factors: high cost of raising funds and lending them; credit premium risk associated with bad and doubtful debts; and high labour costs in the industry. Furthermore, management of banks argue that because of the dispersion of the Kenyan population over a wide area, setting up branches in rural areas can be an expensive exercise. Furthermore, in 1994 the Government imposed on banks a wage increase of 45 percent which the institutions have had to filter through to clients through higher lending rates.

Financial institutions have welcomed the current system of determining interest rates, which is a significant improvement on the previous process where the Central Bank of Kenya set ceilings on both deposits and lending rates. However, financial institutions in Kenya recognise that the current mechanism for determining interest rates is far from being perfect because of the underdeveloped nature and narrowness of the interbank market. Nonetheless, liberalisation of the financial sector has injected greater competition for financial savings in Kenya's financial system.

3.2.5.4 Other Institutional Reforms

In order to improve on regulation of financial institutions which fall beyond the category of commercial banks and non-bank financial institutions, Kenya is considering establishing a "Financial Services Board." This would be an overall regulatory body for the financial sector in the country. (c) Revisions in the Capital Markets Authority Act.

The Nairobi Stock Exchange (NSE) has been in existence since 1954 and initially operated as an informal association of stock broking firms. However, in 1990 the Government of Kenya established the Capital Market Authority (CMA) through an Act of Parliament. The Authority was created in order to provide legal, regulatory and supervisory framework for capital markets in Kenya. Furthermore, in 1994 the Capital Market authority Act was amended and revisions

made to the rules and regulations governing operations of the Nairobi Stock Exchange (NSE). The Capital Markets Authority Act defines the roles and responsibilities of the various actors in the market and provides for implementation of investor protection measures by the Authority. The mandate of the CMA includes promoting the development of capital markets in Kenya.

Several policy and institutional measures have been introduced in recent years in order to improve the operation of capital markets and to stimulate the development of such markets. These measures have focused on enhancing the returns from equity investments in order to reduce bias favouring debt instruments and also to improve the institutional framework. Policy changes have included: removal of the Capital Issues Committee's role in regulating share issues; elimination of the double taxation of dividends by conversion of the withholding tax into a final tax; elimination of the corporate tax on the dividend income of unit trusts; exemption of the withholding tax on the dividend income of corporate tax-exempt bodies, such as pension plans; abolition of stamp duties on retail share transactions; and deductibility of all costs incurred in issue of shares, debentures and bonds. Furthermore, rules regarding foreign participation in the Nairobi Stock Exchange have been relaxed.

As regards institutional framework, a number of measures have been introduced focusing mainly on restructuring the Nairobi Stock Exchange in order to make it more representative of the market and also to provide investor protection. The Board of the Capital Markets Authority (CMA) has been converted from one controlled mainly by stock broking firms, to a more broad-based one comprising of five stockbrokers, two representatives of listed companies, three people representing various interest groups (institutional investors and retail dealers), and the Chief Executive of the Nairobi Stock Exchange.

The Amendment Act of the CMA also gave the Capital Markets Authority, the powers to propose rules and regulations regarding the operations of capital markets in Kenya, including issues pertaining to foreign participation in such markets. The rules regarding foreign participation in the Nairobi Stock Exchange were previously dictated by Kenya's foreign exchange control regulations. The CMA Act also gives the Authority powers to license stockbrokers and traders on the Nairobi Stock Exchange. The CMA Amendment Act also dealt with the 'rights issues' and 'accounting procedures' to be adhered to by stockbrokers and dealers. In order to list on the Nairobi Stock Exchange, a company is required to produce balance sheets of its operations for the last five years, and for those that have been in operation for a lesser period balance sheet for all the years.

In order to enhance further the operations of capital markets in Kenya, the Government intends to create a 'Central Depository System' for capital instruments and to encourage the establishment of 'Rating Agencies'. The legal, regulatory and supervisory framework for capital markets has been significantly enhanced and improved in Kenya. Nonetheless, the markets are far from vibrant as one would have expected with the liberalisation that has taken place. Activity on these markets could be even more vigorous if a 'secondary market' for Government Treasury Bills and Stocks were to emerge and the Government was to accelerate the process of privatisation of state-owned enterprises. Indeed, activity on the Nairobi Stock Exchange was significantly buoyed by the Government of Kenya having offered some of its shares in the Commercial Bank of Kenya and the National Bank of Kenya to the public.

3.2.6 Experience with the Financial Reforms

First and foremost, it has been alluded to that the reforms initiated by the government of Kenya in the 1980s were intended to achieve a number of objectives which included among many others: First, stimulation of the financial savings and deposit mobilisation through higher real deposit interest rates. Second, higher lending rates was going to encourage a more efficient allocation of loanable funds by reducing rent seekers.⁸ Third, reforms were aimed at reducing or eliminating the distortions which was prevailing as a result of administrative controls, such as those between commercial banks and NBFIs and this was suppose to create a more dynamic and efficient financial sector system (Ngugi & Kabubo, 1998).

3.2.6.1 Impact of reforms of interest rates on savings

From data available for the era 1982 to 1990, there was little evidence to suggest that the increased real interest rates which occurred between 1982 and 1990 had positive impact on savings and deposit mobilisation. Deposit Interest rates in both commercial banks and NBFIs rose as a percentage of GDP from 24.2 percent in 1981 to 31.7 percent in 1993 but the rate of increase was less than in the 1970s when real deposit rates were lower. Mwega *et al.* (1990) tested the impact of changes in real deposit rates on private sector savings and financial savings defined as currency and deposits held in the banks and NBFs. Their results did not yield any support for the proposition that real deposit rates had a significant positive effect on either private or financial savings (see Table 13).

⁸ Rent seekers are those opportunists who borrow at low or negative real interest rates and lend at higher rates.

Table 13: Nominal and real interest rates (1975-1990)

Year	1975	1980	1985	1990
Commercial banks' lending rate	10.0 (-7.9)	11.0 (-2.5)	14.0 (0.8)	19.0 (2.9)
Commercial banks' deposit rate	5.1 (-12.0)	7.0 (-6.1)	11.3 (-1.6)	14.5 (-1.0)
NBFIs' lending rate	12.0 (-6.0)	14.0 (0.1)	19.0 (5.2)	19.0 (-1.0)
NBFIs' deposit rate	7.5 (-10.0)	11.0 (-2.5)	14.5 (1.2)	18.0 (2.1)
Treasury bills rediscount rate	5.7 (-11.5)	5.6 (-7.3)	14.1 (0.9)	15.9 (0.3)
Consumer price index (% change)	19.4	13.9	13.1	15.6

Source: Quarterly Economic Review and IFS

Figures in parentheses refer to real interest rate interest rate.

3.2.6.2 Impact of Financial Reforms on Efficiency

It has been argued that the impact of reforms which took place to enhance efficiency of allocating credit in Kenya is hard to determine empirically. Brownbridge (1998) points out that most of the intended consequences intended are of microeconomic nature as opposed to macro and that makes it hard to determine whether the effects have taken place or not. For instance, raising real lending interest rates may not improve resource allocation in credit market if the distortions remain elsewhere in the economy. This position was buttressed by the World Bank (1983a) study on FSAC which found that the efficiency of the financial sector reforms in improving credit allocation was limited because the demand for credit from high yielding investment projects was depressed by the constraint in the real sector such as poor infrastructure and price controls (World Bank, 1993a).

3.2.6.3 Impact on Reforms on Competition during 1970s and 1980s

According to Brownbridge (1989), reforms which were implemented during the 1980s era seems to have yielded some positive results on improving the market efficiency of the financial sector system. For instance, with the removal of interest rates ceilings, deposits rates appear to have become more competitive. Many of the commercial banks and NBFIs were now actively competing for deposits and this was evident through advertisements they were putting up through the media. Services were also improved by the NBFIs and this was followed up by introduction of additional products in the market such as credit cards. On the other hand it must be pointed out that there was less competition in credit markets where the local banks had a disadvantage in servicing the loan requirement by big customers because of capital constraint.

Despite the evidence of competition in some segments of the financial sector, the system is said to have remained oligopolistic in nature, with large banks operating a cartel in setting interest rates and charges. The big banks in the market (i.e. Barclays, Standard Bank and Kenya

Commercial Bank) were shielded from more aggressive competition because of their size and nature of their clientele.

The effort to enhance competition in the financial sector system through reforms of the 1980s and early 1990s was also hindered by the deterioration of public finance in the early part of the 1990s. This period witnessed the government increasing its bank borrowing to fund fiscal deficit which was equivalent to around 8 percent of GDP in 1992/3. This act on the financial sector system led to rapid increase in money supply and inflation which jumped from the rate of 30 percent in 1992 to 46 percent in 1993. In order to resolve the problem the government through its Central Bank raised the Treasury bill rates to 70 percent by the mid-1993. Despite the deregulation of interest rates, by 1993 banks were still reluctant to revise their interest rates to match those of Treasury bills or the rise in inflation. One of the reasons advanced for this, is that of fear of insolvency of some of the borrowers.

3.2.6.4 Impact of Reforms during the 1990s on Financial Sector

During this period of reforms, a number of NBFIs converted to banks or merged with the parent commercial banks. As a result the number of NBFIs reduced from 52 in 1990 to 24 in 1996, while commercial banks increased from 26 to 48 in the same period. By 1996, 11 NBFIs had converted to commercial banks while 4 had obtained permission to start business as banks. Thus, 50 percent of new banks were mainly as a result of conversion from the NBFIs. As such there was a marked decrease in the assets of NBFIs while the assets of commercial banks went up.

As indicated in Table 14, the ratio of the NBFIs deposits to commercial bank deposits reduced from 66 percent in 1990 to 16.7 in 1996, while the commercial bank structure changed such that time deposits were 83 percent of the total deposits in 1996 compared to 62.3 percent of 1990. In view of this growth in commercial bank liabilities was very minimal reflecting mainly the transfer of liabilities from NBFIs to commercial banks. At the same time GDP growth rate was slow and as the figures indicate, when GDP growth rate showed a downward trend, M2/GDP grew at a slower pace.

Table 14: Financial sector development during reform era (1990-1996)

Period	M2/GDP	Bank assets/ GDP (%)	DC public	DC private	RGDP	NBFIs Assets/GDP	NBFIs /Bank deposits
1990	31.4	28.7	43	57	4.2	16.1	66.0
1991	33.6	30.3	42	58	2.1	16.5	59.1
1992	38.8	36.5	35	65	0.5	16.7	51.1
1993	39.0	36.0	33	67	0.1	16.3	42.4
1994	40.6	40.6	41	59	3.0	15.0	37.5
1995	41.4	45.0	33	67	4.9	10.2	25.6
1996	45.1	50.4	29	71	4.6	7.5	16.7

Source: Central bank of Kenya, statistical review

On the asset side, the advances/deposit rate indicated a declining loan advance up to 1993 and an increase later that mainly reflected financial repression. With regard to the depth of the financial sector, the trend indicates that the sector achieved financial deepening with an increase in M2/GDP ratio. However, these results may be attributed to the conversion of NBFIs to commercial banks, which represented a transfer of liabilities and not an actual increase in financial assets and liabilities, which implies no financial deepening (Ngugi, 2000). This line of thought is supported by the marginal increase in the deposits of commercial banks. The rate of growth of deposit was also volatile, thereby reflecting that the interest rate was volatile and negative.

On the issue of the ratio of commercial bank credit to total, the variable indicates stagnation in the trend while the advanced/deposit ratio (proxy for demand for credit) was lower compared to NBFIs ratio. This result partly reflects a shift for quality assets among the commercial banks. Loans were not attractive with increase in uncertainty in the risky environment characterised by macro-instability. These factors were compounded by increase in bank bad debt, and high reserve requirement that penalised the banks as an implicit tax, thereby making commercial banks charge higher lending rates. These higher charges on loans discouraged further borrowing from private sector, while at the same time encouraging increased distressed borrowing.

3.2.6.5 Effect on Interest Rate – 1990s

Interest rates were negative in real terms immediately after the liberalisation and were highly volatile, gaining unrealistically high positive real interest rates in 1995/96. This was a sign of financial distress. The interest rate spread between lending and deposit rates also widen thereby indicating the high inefficiency which was prevailing in the financial sector system (see figure 8), increased macro-instability increasing the risk premium, weakness in the legal framework weakening the drawing and enforcement of financial contracts, and policy actions including

reserve requirement that acts as an implicitly tax. This wide margin on interest rates reflects failure to achieve competitiveness in the financial structure where four large banks continued to dominate the market, while the increase in the reserve ratio acted as a deterrent for entry of new firms into the market.

3.2.7 Summary

The financial sector reforms adopted by the government in Kenya had varied effects on the development of the financial sector development and in particular banking sector system. The government repression policies took the form of establishing government owned commercial banks, imposing direct controls over interest and credit. The reforms also involved less stringent rules for NBFIs as opposed to commercial banks. Despite all these policies inflicted upon the financial sector system, the repression effect on the financial sector is said to have been less severe and that it did not prevent the development of the financial sector in terms of depth and diversity. One important development since the early 1970s is the entry of local financial institutions into the banking sector system. This has led to a situation where the banking sector is not dominated by the foreign banks, but equally dominated by the foreign and local banks.

During the 1980s, a number of reforms were implemented. These included the gradual phasing out of the interest rate and credit controls. Reforms also included the changes to the banking regulation laws and creation of bank deposit insurance fund (Deposit Protection Fund). After the bank crisis the banks which were found wanting, were taken over and merged to form the government-owned bank in 1990. The Central Bank of Kenya closed down some of the failed financial institutions and two large government owned banks; the National Bank of Kenya on the other hand was restructured 1990 after it was found to have problems.

One of the most dynamic features of the Kenyan financial sector has been the rapid expansion of local NBFIs, and commercial banks in recent years. This development has been stimulated by the feeling that more of the economic sectors have not been adequately serviced by the existing banks. The growth of NBFIs though encouraging at face value has been rather complex in that the mushrooming of these institutions came as a result of regulatory policies which were tailored to favour them as opposed to levelling the playing field in the banking sector.

On the regulatory part of the banking financial sector system, it has been argued in literature that this has not been very effective. For instance, following the bank crisis of the mid-1980s, the banking laws were revised and supervisory capacity of the Central Bank of Kenya strengthened.

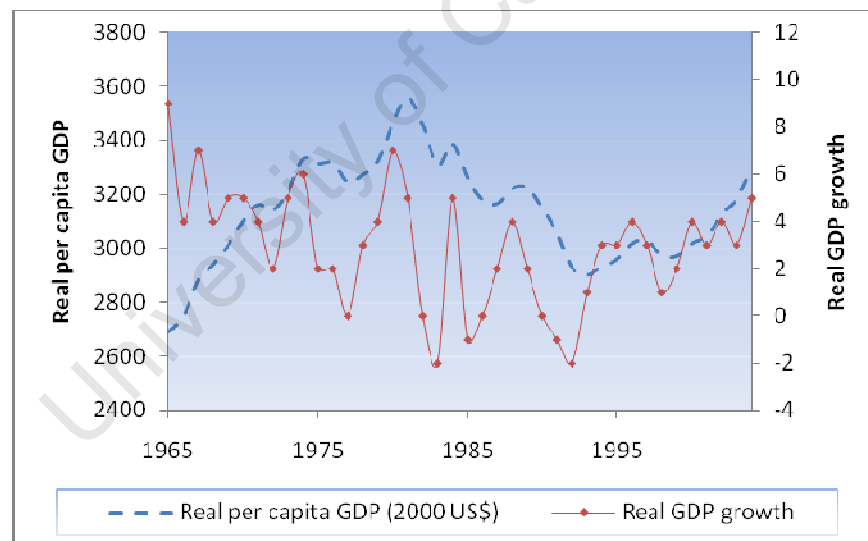
However, these changes were undermined by the political interferences which rendered the Central Bank of Kenya to be ineffective as the Central Bank was prevented from carrying out the inspection. This trend has since been reversed with inspections now being conducted out both on sight and off sight.

In summary, the banking sector in Kenya, though not as developed as South Africa, is considered much better and more developed than most of the other sub-Saharan countries which include Zambia. Furthermore, despite the repression of the financial sector prior to 1990s, and the piece meal policies which were initially implemented by the government, the issue of financial disintermediation was avoided. Results also appear to be encouraging as the financial sector systems seem to have weathered the storm.

3.3 South Africa

South Africa's macroeconomic history depicts steadily worsening growth performance but reasonably sound short-run macroeconomic dynamics (Moll, 1992).

Figure 8: Real GDP Per Capita and Growth of Real GDP.



Source: South Africa Reserve Bank, quarterly bulletin

Post-world war II growth history of South Africa displays two characteristics of a long-term decline in the pace of expansion and increasing volatility. This is illustrated in Figure 8: growth averaged around 5 percent per annum in the 1960s, but then declined steadily to below 2 percent per annum in the 1980s. The slowdown was associated with declining incomes per capita in the

1980s and worsening employment conditions; the proportion of the labour force without formal jobs rose from 19 to 40 percent between 1970 and 1990.

According to Strydom (2002), structural changes, the high cost of apartheid, sanctions, and economic disruptions from abroad were important factors in explaining this poor performance. During the 1960s and early 1970s the economy operated under growing government intervention. The structural problems of the time related to the policy of imports substituting industrialisation, and high tariff barriers. Although the need for high tariff barriers had run its course by the 1970s the government continued to enforce these policies to avoid any shortages of strategic materials because of the threat of sanctions.

In the mid 1970s these interventionist trends were compounded by the oil crisis and the Soweto Uprising, followed in the early 1980s by a slowdown in the world economy, and the growing sanctions and disinvestment movements against the country. The government reacted by imposing strict controls on the flow of international capital, forcing South African companies to invest domestically. Because of the degree of protection offered to these companies, it gave them little or no incentive to train and skill their workforce in order to improve productivity and become internationally competitive. Disinvestment also led to the intensification of the concentration of ownership in the economy as large South African conglomerates bought out the foreign multinationals. The effect of this on employment was indirect: slowing economic growth as well as declining investor confidence created fewer employment opportunities than might otherwise have been the case.

Furthermore, Figure 8 illustrates that growth has not only been steadily declining, but has also been highly volatile. This volatility appears to have been primarily a response to a series of external and internal shocks, rather than a natural business cycle. There were two main sources for these shocks: politics and gold.

The political struggle had a rising influence on economic conditions over time. After Sharpeville (1960) growth barely faltered; a year after Soweto (1976) the economy experienced zero growth for the first time since the war and by the 1980s there were several years of negative growth, interspersed with partial recoveries, with rising internal violence and the imposition of external financial sanctions in 1985. Financial sanctions were the major external macroeconomic event of the 1980s.

South Africa's external trading position was affected by both developments in world commodity markets and sanctions. The first oil price shock, along with sanctions, appears to have led to a significant worsening of the non-gold terms of trade. However, gold saved the day for the economy at least until the early-1980s. Gold price increases in the late 1970s offset the developments on the non-gold account and this led to a mini-boom in 1979-80. Overall changes in the terms of trade were quite moderate for two decades.

3.3.1 Macroeconomic Trends of South Africa

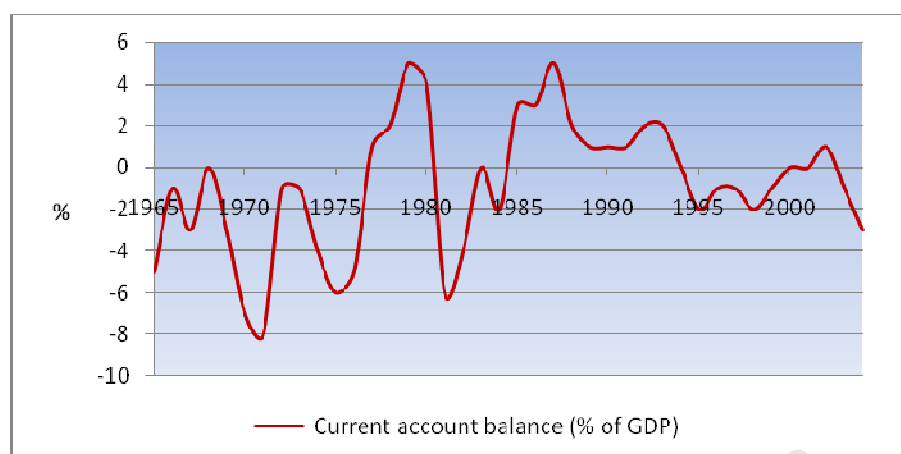
The above shocks were reflected in a range of macroeconomic outcomes as discussed below. Five changes are emphasised here:

3.3.1.1 The Balance of Payments

Mohr (1999:309) holds the view that "the pace of economic activity and direction of economic policy in South Africa have frequently been governed by the state of the balance of payments." During the 1950s and 1960s South African economic policy was based on a mixture of import substitution and commodity exports. The import substitution strategy relied on a sizeable domestic market and high tariff barriers. As the importance of mining diminished, it became clear that the import substitution did not have the desired effect of limiting the growth of the current account deficit. This was propounded by the increase in domestic demand for imports of goods and services. During this time the deficits were largely financed through net inflows of foreign capital.

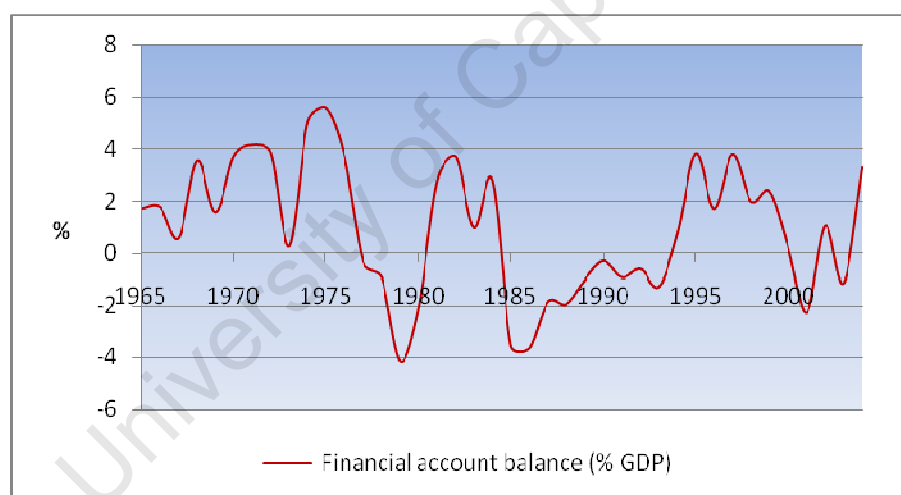
However, following the domestic and political unrest of 1976, the deficit on the current account could not be supported by the capital account, as net outflows of foreign capital were recorded, as is reflected in **Figure 9** and Figure 10. This led to a balance of payments constraint on economic activity. To overcome the problem, South Africa had to access foreign financing and pursue domestic policies that constrained domestic demand. The result was a long and severe economic recession. However, towards the end of the 1970s an international commodity boom allowed South Africa the opportunity to once again afford a current account deficit.

Figure 9: Current account balance, 1965-04 (% GDP)



Source: South African Reserve Bank, Quarterly Bulletin, Various.

Figure 10: Financial account balance, 1965-04 (% GDP)



Source: South African Reserve Bank, Quarterly Bulletin, Various.

After the foreign debt crisis of 1985, when the government imposed repayment restrictions on foreign debt after foreign banks had refused to roll over short-term loans, South Africa was cut off from foreign financing and was forced to run a surplus on the current account. In addition to the debt repayment problems, South Africa experienced massive capital flight, leading to a sustained deficit on the capital account. From 1985 balance of payment considerations often dictated macroeconomic policy. This once again necessitated a contraction policy on the part of the authorities. Deflationary policies were introduced to try and maintain a surplus on the current

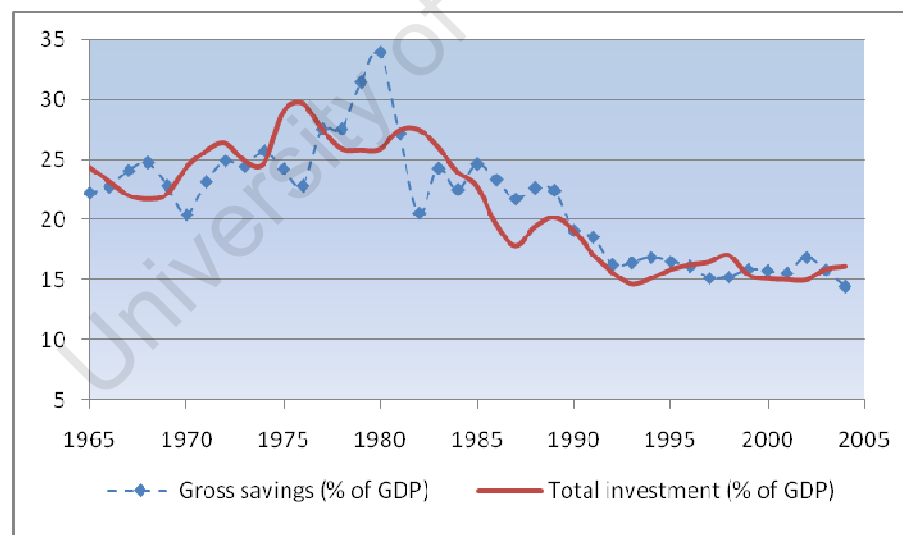
account, with monetary policy severely curbing domestic spending. These restrictive monetary measures remained in place well into the 1990s, having a profoundly negative effect on the creation of employment and on economic growth in South Africa.

Since the re-entry of South Africa into global markets in 1994, the current account has tended to move into a deficit position. This has largely been financed by high real interest rates that have attracted considerable amounts of short-term capital. The high interest rates have, however, constrained investment, as well as dampened employment creation and growth. The fact that the balance of payments is still a major constraint to economic policy means that South Africa has no option but to rely on a strong export orientated growth path. The role of the financial sector within this type of strategy is clear and being sufficiently addressed through the reforms.

3.3.1.2 Savings and Investments

Savings and investment are crucial prerequisites for sustainable growth and development. From Figure 11, it can be seen that both savings and investments, as a proportion of GDP, have fallen consistently since the mid 1970s.

Figure 11: Gross savings and total investments (% of GDP) 1965-04



Source: South African Reserve Bank, Quarterly Bulletin, Various.

Furthermore, it is evident here that the average gross savings as a percentage of GDP reached a peak of 28.7% in the period 1976-1980, decreasing to 14.9% for the period 1996-2000. Similarly, the average gross investment as a percentage of GDP decreased from a high of 28.5% in 1971-1975, to 15.9% in 1996-2000. The main reasons for the long-term decline in investment

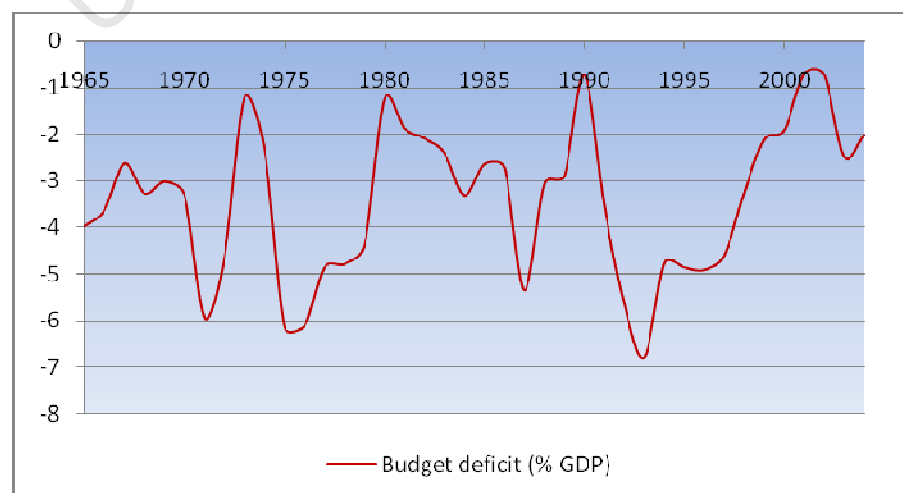
are, amongst other things, low levels of domestic saving, adverse labour developments, the impact of sanctions and disinvestment, and the weakening exchange rate (Du Toit, 1998). Another important factor was the decline in public investment, which fell (for the period 1980-1990) from 12-13% of GDP to less than 6%.

According to Jones (2002) the South African economy would have to achieve an investment ratio of 25% in order to sustain the growth rates necessary to create sufficient employment opportunities in the formal economy. Without this level of investment unemployment will increase. While it is accepted that foreign direct investment can help growth, it is limited to a maximum sustainable level of around 2-3% of GDP. Ultimately, then, it is the level of national savings that will determine the resources available for creating employment. Mokate (2000) concurs that the critical issue is the extent of government saving required in order to create employment in South Africa.

3.3.1.3 The Budget Deficit

One of the key indicators of fiscal stance in South Africa is the budget deficit, as measured by the difference between government revenue and expenditure, as a percentage of GDP. Referring to (Figure 12) the budget deficit in South Africa, with the exception of the years 1974-1975 and 1978-1979 and between 1992-1993 and 1993-1994, has been small, and at times in surplus. The large deficits in the 1970s may be attributed to the significant surge in apartheid-related expenditure and the cost of security and defence (Annett, 1996). In the early 1990s the increase in the deficit was caused by an increase in expenditure, which was not offset by an increase in revenue.

Figure 12: National budget deficit, 1965-2004



Source: South African Reserve Bank, Quarterly Bulletin, Various.

The need to fund social upliftment and public investment saw government capital expenditure increase from 1.7% of GDP in the 1991-1992 fiscal year to 2.8 and 3.9% in the fiscal years 1992-1993 and 1993-1994, driving government expenditure up from 29.2% of GDP in the 1991-1992 fiscal year to 33.1 and 34.6% in the fiscal years 1992-1993 and 1993-1994, when revenue as a percentage of GDP remained constant (Department of Finance, 1997).

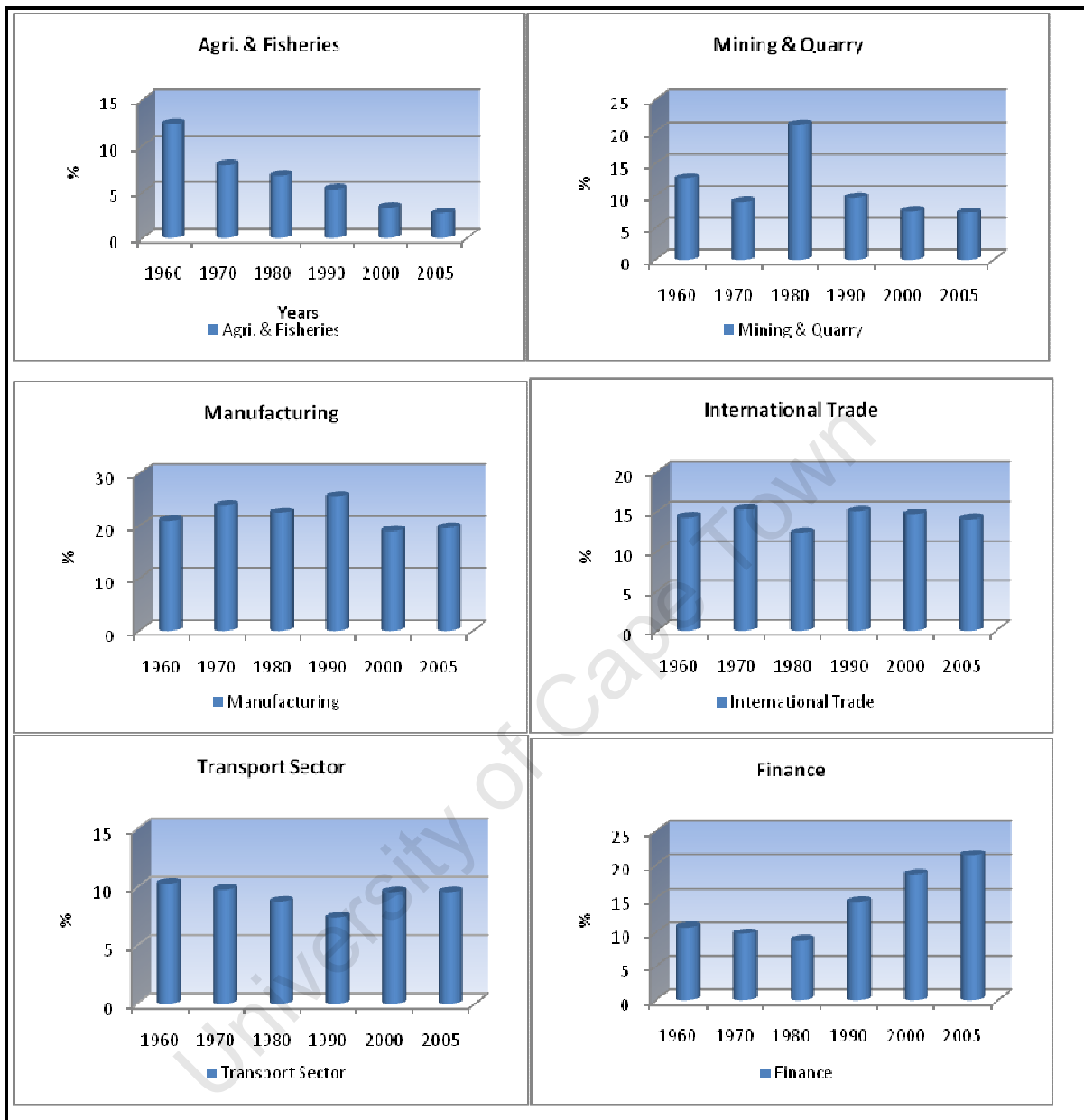
The trend in fiscal policy in South Africa had been very restrictive throughout the 1980s, and especially in 1990. This was followed by an abrupt reversal in policy stance, which was more 'relaxed' after 1993. Since 1995 fiscal policy has been tightened considerably, broadly in line with the prescriptions of GEAR. GEAR takes the view that if the government deficit is 5% or higher, private investment would be crowded out.

Mokate (2000:60) underscores the fact that there are differing points of view amongst economists about whether or not deficit spending leads to 'crowding out' or 'crowding in' of private investment. Government expenditure may actually 'crowd in' private investment. Mokate gives the example of expenditure in rural areas: infrastructure and human resources would likely increase the amount and profitability of private investment opportunities. The recent surpluses largely reflect the prescriptions of GEAR. The results of these efforts were passed onto the private sector in tax cuts, while budget deficits were reduced to under 2% in 2002.

3.3.2 Key Drivers of the Economy

Figure 13 analyses the sectoral contributions of various sectors to the GDP for South African economy. The aim of this analysis is to examine whether the financial sector is an important contributor to GDP and growth, relative to other key sectors (e.g., manufacturing, agriculture, mining and quarrying), of the economy. Through rank analysis (i.e., ranking the various sectors in terms of their contribution to GDP), it was found that the financial sector increased in importance from being number 6 in 1960 to number 1 in 2004, hence indicating the importance of the sector in relative terms in the national economy. In relation to other sectors of the economy, it is the only sector that displayed considerable improvement in terms of its contribution to GDP. It can be inferred that the financial sector is a dynamic sector of the economy. Also worth mentioning here is the fact that though mining has always played a very vital role in the economy of South Africa, its contribution in relation to others (such as manufacturing, trade and transport) has been declining.

Figure 13: Trends in Percentage Sector Contribution to GDP (1965-2005)



Source: South Africa Reserve Bank

3.3.3 Overview of the Financial Sector in South Africa

There are two levels of formal financial sector in South Africa, the institutional and market levels. At the institutional level are the banking and non-banking financial intermediaries whereas at the market levels are the stock market, the bond market, the money market and the foreign exchange market. Falkena (1999) reviews the levels as follows.

3.3.3.1 The Banking Sector in South Africa

At the apex of the banking system is the South African Reserve Bank, which is the primary monetary authority and custodian of the country's gold and foreign exchange reserves, *inter alia*. The primary functions of the Reserve Bank are to protect the value of the rand and to control inflation. While in principle it is independent of government control, in practice it works closely with the National Treasury and assists in the formulation and implementation of macroeconomic policy.

The Reserve Bank regulates money supply by influencing the interest rates charged on loans to other institutions. Until 1975 the Reserve Bank enforced fixed interest rates on long-term government securities, but thereafter it allowed transactions at market-related prices. Direct control over deposit interest rates quoted by banking institutions was abolished in 1980. However, it still exercises considerable indirect control through its own repo rate.

The private banking sector was dominated by commercial banks until the 1950s when banking services began to diversify. Before the 1950s commercial banks had avoided services such as personal loans, property leasing, and credit-card facilities, but since then new institutions such as discount houses, merchant banks, and general banks emerged to meet this demand. Commercial banks started to increasingly enter into medium-term credit arrangements with commerce and industry. They acquired interests in hire-purchase firms and leasing activities and expanded their operations into insurance and even invested in manufacturing and commercial enterprises.

What is clear though is that the growth of the banking sector was only very moderate in the 1970s. The assets of the commercial banks and the building societies, the largest mobilisers of capital in the banking sector, grew at a slower rate than GDP, at 15,3 per cent and 14,5 per cent respectively compared with 17,1 per cent by the GDP. At the beginning of the decade the banking sub-sector was struggling to recover from the effects of the Stock Exchange crash of 1969 and a heroic increase in GDP of 11,4 per cent in 1969 (12 per cent in the financial year 1969-70). Growth decelerated rapidly, when the oil price introduced the cost push inflation that triggered a sharp increase in the inflation rate. South Africa's government proved unable to control it and the country embarked upon a period of double digit inflation that was to last for over a generation. Nor even the rise in the price of gold could reverse this trend other than momentarily. Indeed, the deceleration was further reinforced by the Soweto riots of 1976. The financial sector contribution to growth grew by 3.1 percent annually in the 1960s declined by 2.6 percent in the 1970s, when the figures are adjusted for inflation. This unusual state of affairs in a

modern economy, with the GDP growing at a faster rate than the financial sector, was the result of the rising gold price boosting GDP at a time when inflation and interest rate ceilings were hurting the economy.

During the late 1980s building societies that had listed holding companies on the then Johannesburg Stock Exchange (since 2005 now called JSE Limited) and had commercial and/or general banking arms increasingly challenged the 'big five' commercial banks i.e., First National Bank (formerly Barclays), the Standard Bank of South Africa, Nedbank, Volkskas and Trust Bank. The Deposit taking Institutions Act of 1991 brought South Africa in line with internationally recognised standards for capital requirements by formalising the overlapping of functions between the banks and the building societies that had existed for more than a decade and building societies were effectively abolished (Verhoef, 1994).

In the 1990s the banking sector went through consolidation and re-organisation. Four of the bank's leading financial institutions i.e., Allied Bank, United Bank, Volkskas, and Sage Banks, merged to create the largest banking group in the country, Amalgamated Banks of South Africa (ABSA) in February 1991. The banking industry underwent further reorganisation in the mid-1990s, in part to establish banking services in poor communities that were neglected under the previous apartheid government (Verhoef, 1992b).

3.3.3.2 The Stock Market

At the apex of the market level of the financial sector is the Johannesburg Stock Exchange (JSE). Founded in 1887 initially to fund the development of mining companies in the wake of the discovery of gold in the Witwatersrand in 1886, the JSE has a long history. Clearly, the development of the stock exchange was demand-driven rather than being a deliberate government policy (supply-leading approach) to set up an exchange as is being advocated by the World Bank for many countries in Africa. Crucially, it was set up by private mining entrepreneurs looking for innovative ways to raise finance. Hence its development resembles the postulations of the demand approach argued by Rajan and Zingales (1998). This is in contrast with the more recent African stock exchanges promoted by governments in the 1990s, for instance, those for Ghana, Malawi, Mozambique, Tanzania, Uganda and Zambia. These exchanges were established following the World Bank economic adjustment policies so as to aid the privatisation process of state enterprises.

Though considerably developed, the JSE Securities Exchange South Africa is classified as an emerging market. Emerging markets have been traditionally referred to as less-developed (LDC) markets by academics. The term 'emerging market' was coined in 1981 in an effort to increase its appeal to institutional investors (Errunza, 1997). The JSE is characteristically an emerging market. In the past, the main barriers to foreign investment in the South African market were legal barriers and those relating to specific emerging market risks such as liquidity, political, economic policy, and currency risk. External factors that temporarily submerged the JSE in the mid-1980s until the early 1990s were international sanctions and the government response of introducing foreign exchange controls.

3.3.3.3 Non Bank Financial Institutions

Under the 1964 Banks Act, apart from the commercial bank, South Africa formally recognised other deposit-taking institutions as banks (Marlin, 1968). These institutions included hire purchase, savings and general banks. As a group, these various institutions not only competed among themselves for loanable funds, but also with other financial intermediaries, including commercial banks.

On the other hand, depositors with the near banks as the case was with building societies were unable to withdraw their deposits by means of checks, although the 1964 Banks Act did spell this out. Some of these institutions performed some of the functions of commercial banks and operated with extensive branch network.

Like the building societies, the 'near bank' encouraged people to transfer their bank accounts to them, and allowed them free withdrawal of their deposits. While section 21(2) of the 1964 Banks Acts seemed to be designed to prohibit free withdrawal of the time deposits, the wording of the Act left some loopholes, namely specification by the bank that the deposit can be withdrawn sooner than the declared time frame, at the discretion of the bank (South African government, 1964). Individual accounts were restricted under the 1964 Bank Act to a maximum of Rands 6,000 in the case of savings deposits. Consequently, the return flow of these institutions as a group and consequent non-bank credit multiplier were small compared to commercial banks.

3.3.4 Direct Controls, 1965-1980

From the mid-1960s the South African monetary authorities increasingly made use of direct measures such as credit ceilings in their attempt to curtailing overspending and dampening inflation. Credit ceiling were in force from 1965 to 1972 and again from 1976 to 1980, while

high cash reserve and especially liquid asset requirements also restricted the banks' activities. These restrictions encouraged the development of grey markets in which companies and individuals increasingly made use of the direct lending, bypassing the banking system in an act of so called disintermediation.

During the 1960s and 1970s, the SA Reserve Bank made use of direct controls over the ability of banking system to supply money and credit, especially variable liquid asset requirements and credit ceilings, in order to influence domestic liquidity and inflation rate (Franzen, 1983). The SA Reserve bank controlled short-term deposit rates and determined the duration of the hire purchase agreements. During this period South Africa had no secondary bond market. In fact credit ceilings were in force from 1965-1972 and again from 1976-1980, while cash reserves, especially liquid assets requirements were implemented to restrict some of the activities of banks. As already indicated in the previous sections, for domestic residents, outward movement of capital was tightly controlled. A dual exchange rate system was in put in place where the market determined exchange rate were only applied to non-residents, who were free to move their capital (Moll, 1999). There were additional control measures in place during this period 1967-1980 such as ceiling on advances, exchange controls as well as consumer credit controls (Botha, 1997). The repression of financial sector system led to financial disintermediation where transactions of institutions were performed 'off-balance-sheet' (Moll, 1999). This line of argument is consistent with Fourie *et al.*, (1995) who argued that the restrictions encouraged development of 'grey markets' in which companies and individuals increasingly made use of direct lending, bypassing the banking system in an act of disintermediation.

Inflation also accelerated considerably from the early 1970s. Since interest rates partly controlled by the authorities were not allowed to compensate depositors fully for inflation, savers started to shift away from depository savings with banking institutions to other, more inflation proof savings instruments, which often offered attractive tax breaks. The banks' balance sheets therefore grew less rapidly than, for example, those of near banking. Under these circumstances few banking institutions were established. Notably, interbank discount House Limited started doing business in 1972.

3.3.5 Deregulation of Financial Sector, 1980-1989

With increasing adherence to free market principles since 1980, the credit and interest rate ceilings applicable to South African banks were abolished and their cash reserve and liquid asset requirements reduced (Fourie *et al.*, 1996). In addition, the Register of Corporation (which

limited competition between the banks) was terminated in February, 1983, while the substantial numbers of new banks were allowed to start operations. The outcome of this policy shift was that, the balance sheet of banking sector increased sharply. Furthermore, competition amongst the banks and between the banks and building societies increased too. This led to a decline on their profit margins and higher interest rates compounded this problem. As a result of the reform, the number of banking institutions under supervision of the Registrar of Banks rose from 50 in 1980 to 60 in 1989.

3.3.6 Institutional Realignment, 1989-1993

By the late 1980s South African banks were faced with intense completion which led to a fall on the profit margins of the banks. In addition banks were also faced with high costs of modern technology and losses due to loan exposures. As alluded to earlier, there was intra-bank completion and as the business of banks and building societies converged, a basis for equitable competition between them was instituted by bringing them together under the same legislation called Deposit Taking Institution Act of 1990 with the exception of the relatively small mutual building society sector, which continued to operate under a separate Act.

In view of this banks started to strengthen their positions, with less emphasis on the expansion of their balance sheets and more emphasis on quality business. During this period, a considerable number of mergers and takeovers took place. Notable among them were: the mergers which involved the Nedbank and the South African Permanent Building Society in NedPerm Bank in 1989, and of United, Volkskas and Allied in ABSA in 1991.

During this period 1989-93 five major banking groups had developed, namely the ABSA, Bankorp, First National, Nedcor and Standard Bank group. In 1992 ABSA gained control over Bankorp thereby reducing the concentration of the big banks to four. The combined asset portfolio of ABSA and Bankorp came to 33 percent, while that of the four after the merging of the two (ABSA and Bankorp) came to 95 percent of the total assets of the financial industry. At the end of 1991 South African financial sector industry constituted 51 banks. This number reduced to 40 in 1993 and the reason for this was realignments which involved mergers reduced in the banking industry.

3.3.7 Legal Framework

The first Currency and Banking Act of the Union (Act No. 31 of 1920) referred to banks only in general as being companies involved in receiving or accepting deposits of money, subject to

withdrawal on demand by check. However, under the Banking Act of 1942 the people's banking was defined as an association established for the purpose of enhancing thrift banking. In view of this, a deposit receiving institution was simply viewed as a residual that is a person accepting a deposit, not being a commercial bank.

The above legal Acts were followed by the Bank Act of 1965 which subjected all classes of banking institutions which had mushroomed earlier (except discount houses) to the same financial requirement. In view of this a new classification of banking institutions was mooted, namely commercial, savings, hire purchase and general banking based on the relative importance of the banking business conduct. The sharp increase in the financial institutions in the 1970s made it difficult to classify them. The difference between these institutions became so indistinct that the Registrar with the Financial Institutions Amendment Act No. 103 of 1979 reclassified the two types of institutions as general banks. Later through the Financial Institutions Amendment Act No. 106 of 1985, the government revoked the distinction between commercial banks, general banks and merchant banks, and all other banks, with the exception of only discount houses, were classified as banks. The deposit taking institutions Act No. 94 of 1990, consolidated and revised the Banks Act, 1965 (Act 24 of 1965), and Building Societies Act, 1986 (Act 82 of 1986), and finally they also repealed the distinction between banks, discount houses and equity building societies. In 1993 the Deposit taking Institutions Act was renamed the Banks Act, No 94 of 1990.

3.3.8 Monetary policy

The new monetary policy of South Africa in the early 1960s was enacted in the hope that the former orthodox treatment of commercial banks, as differing basically from all other deposits-receiving institutions, had lost much of its validity. The new policy rejected the idea that commercial banks are unique in the sense that they alone can create money and therefore the supply of loanable funds independently of the public's savings.

An effected monetary policy in South Africa under the Act depended on four conditions, according to Gerhard de Kock (1965): First, the economic situation must be correctly diagnosed, with short-term tendencies indicated reasonably accurately. For this to take effect, up-to-date and reliable economic data must be collected and interpreted. The hypothesis of economic tendencies must be tested continuously against the facts as they become known and must be changed whenever necessary. Errors of monetary policy particularly on timing must be attributed to faulty assessment of economic conditions, rather than to inadequate control.

Second, there must be an intelligible presentation of the case for action. That is, policy makers cannot be expected to understand why monetary action is necessary, if the case for it is clad in technical terms.

Third, monetary policy and interest rates must be flexible. Monetary policy should be adjusted speedily to changes in economic conditions. The fact that economic activity is subject to cyclical fluctuations and that in a relatively 'open' economy like South Africa's broad savings occur in balance of payments, is well known. The flexibility would therefore appear to be necessary for interest rate policy. Interest rate stability is not an objective to pursue at all times, since it is general economic stability which should be a main objective, and variation in interest rates can be stabilising.

Finally, maximum reliance should be placed on free competition, using the interplay of supply and demand in the market to regulate the cost and allocation of credit. The approach in the 1964 Bank Act did not force the various deposit-taking institutions into predetermined, highly specialised moulds. Banking institutions under this policy had to combine all their activities under one umbrella if they so wished. This approach was premised on the belief that a sounder development of banking structure would be obtained by allowing the financial sector a considerable amount of freedom to develop along lines they deemed fit. Strong support for flexible and competitive approach taken in the 1964 Banks Act came from the Canadian Royal Commission on Banking and Finance which stressed the importance of having a competitive and creative financial system.

3.3.8.1 Monetary policy (1965 to 1980)

Although in the initial stages of 1964 under the Banks Act, monetary policy was designed to permit continuous competition between financial institutions within a framework of allowing overall monetary control, the first year of the operation of the Act, 1965, turned out to be a more inflationary one than was envisioned by the policy makers.

For instance, direct controls and the general approach to monetary policy, including adjustment to Bank rate, did not achieve the desired outcome of low inflation as measured by the changes in the consumer price index (CPI). Inflation accelerated between 1965 and 1980: "inflation established itself firmly between the levels of 10 and 20 percent, and the natural development of financial markets was suppressed by the need for direct controls over banks and other financial institutions", (Stals, 1996). Although the period between 1965 and 1980 is taken as the period of

direct controls, in respect of inflation it should be split into sub-periods: up to 1973, when inflation was at single digits, and from 1974 to 1980, when South Africa suffered sustained double-digit inflation, which continued into 1980s.

Between 1965 and 1973, the Bank rate moved between 5.75 percent and 6.25 percent, with an average of 6 percent. At the same time the minimum overdraft rate of banks were no longer fixed at a constant margin above Bank rate, although a semi-informal link between Bank rate and the prime rate of banks was retained until 1982 (Stals, 1996). The link was subsequently reintroduced, inter alia, because the actual rediscount rate charged for SA Reserve Bank accommodation frequently differed from the official Bank rate, implying that the minimum lending rate rather followed other money market rates. Bank's minimum lending rate averaged about 8 percent during the first sub-period (1965 to 1973), but varied between 6 percent and 9 percent. On the other hand inflation was at an average annual rate of about 4.6 percent, but accelerated sharply from 1968 to the end of this sub-period, implying that the average real minimum lending rate was about 3.4 percent. Monetary policy therefore supported relative price stability during this sub-period, but failed to address the acceleration in inflation. This is confirmed by the fact that the domestic inflation problem already received attention by the mid-sixties, as well as by the analysis of sub-period below.

Increase of inflationary pressure gave rise to a conference which was held in 1966 to deal with this issue (Richard, 1967). Six papers were considered at this conference and their debates on inflation are recorded in the conference proceeding (Van der Horst, 1967).

At this conference, Hobart (1967) stated that the main strength of the inflation of our time was that we expected it to continue. This view was supported by others who included Samuels (1967: 292), who stated that "once the market's expectations are broken, the problems of the transition to a non-inflationary era will become progressively easier. Reflecting on this conference some 40 years later, the reaction is that the issue remain the same, only the names of the conferences considering them has changed.

In the second sub-period (1974-1980), inflation accelerated to a level of 10 percent per annum and remained at that level for a sustained period of time up until 1992. Between 1974 and 1980, banks' minimum lending rates moved between 8 percent and 12.25 percent, with an average of 10 percent. As was the case in the first sub-period, the minimum overdraft rate of banks was no longer fixed at a constant margin above Bank rate, but some semi-formal link was nevertheless

retained. Bank rate averaged about 8 percent during this sub-period, but moved between 5.75 percent and 9 percent. Inflation was at an average annual rate of 12.1 percent, but continued to accelerate sharply towards the end of this sub-period, implying that the average real minimum lending rate was about minus 4.1 percent. Monetary policy, therefore, did not contain inflation during this sub-period, while direct controls resulted in the adoption of interest rates which were too low in comparison to general rate of increase in price level.

The major policy changes associated with 1981 discussed in the next section (i.e., the movement from direct controls to a market-oriented monetary policy associated with the appointment of the De Kock as governor of the SA Reserve Bank in 1981) were announced by De Jongh in 1980. The policy shift was that credit ceiling would be abolished with effect from 1st of September 1980 (De Jongh, 1980).

3.3.8.2 Monetary policy (1981–1994)

The period 1981 to 1994 was characterised by a return to more market-oriented ‘indirect’ monetary policy. The liquid asset system was abandoned in favour of a cash reserve system, and open market operations became a key instrument of monetary policy. In this way, monetary policy shifted from controls that operated directly on the balance sheets of banks to measures that influenced bank balance sheets indirectly via changes in the balance sheet of the central bank (Verhoef, 1994).

The re-orientation of monetary policy in the early 1980s was led by the government-appointed Commission of Inquiry into the Monetary System and Monetary Policy in South Africa (referred to as the De Kock Commission after the name of the chair, who in 1981 became governor of the Reserve Bank)⁹. The commission was established in 1977 and although its final report was not published until 1985, its recommendations began to take effect in policy from 1979.

Until 1985, the monetary reforms were accompanied by the liberalisation of the balance of payments. The shift away from direct controls and the associated rationing of foreign exchange was an integral component of the reforms proposed by the De Kock Commission. Increasing political instability, which came to a head in 1985, led to a drop in foreign investor confidence that, in turn, precipitated a debt crisis. The crisis forced the authorities to abandon the balance of payments reforms immediately. Moreover, the crisis initiated a period lasting until the democratic elections of 1994 in which persistent capital outflows dominated macroeconomic

⁹ Hereafter referred to as the De Kock Commission.

policy. From 1985 to 1994, monetary policy was often influenced and sometimes dominated by political crises and the associated pressures on both the balance of payments and fiscal policy.

The De Kock Commission identified four ultimate objectives of monetary policy: the relative stability of the general price level; the stability of the external value of the rand, together with the balance of payments equilibrium; 'optimal' real economic growth; and high and stable levels of employment.

The first objective was given priority, although it was recognised that the ranking of the four objectives might change from time to time in response to short-term considerations. Late in the period, the first two objectives were given special status. Stals, who became governor in 1989, increasingly came to refer to the objectives of the bank as the maintenance of the "internal and external value of the rand". This narrower view was endorsed by the new government, following the 1994 elections, and was officially adopted in the new constitution agreed in 1996.

A strong signal of the shift toward a more market-oriented monetary policy came in 1980. In March, the authorities abolished deposit rate controls (Verhoef, 1994). It was recognised that these controls had prevented banks and building societies from competing for call funds and kept deposit interest rates below market-clearing levels. Six months later, in September 1980, the ceilings on bank credit to the private sector were removed.

The move to market-oriented monetary policy was reinforced in 1981/82, when the authorities abandoned the longstanding liquid asset system of monetary control in favour of a cash reserve system (Jacobs, 1982). The ineffectiveness of the liquid asset system had been recognised as early as 1965, as discussed earlier. But it was only following the work of the De Kock Commission and the shift in monetary policy internationally that the need for effective monetary control attracted sufficient political support to enable fundamental reform.

By 1980, successive upward revisions to the liquid asset requirements had brought the minimum ratios to 58%, 35% and 5% of banks' short-term, medium-term and long-term liabilities to the public (for 'large' banks and only slightly lower for other banks). Even in combination with credit ceilings, these requirements proved inadequate to the task of controlling banks' liquidity and credit creation.

Gidlow (1995a) identifies several important weaknesses in the system. One was lags in reporting changes in banks' excess liquidity positions, in articulating an appropriate policy response and in

implementing new requirements, the cumulative effect of which was to render timely policy responses all but impossible. Another was the inability of the system to force an overall contraction in the level of credit, rather than simply limit its growth. A related and important weakness was the 'ratchet' effect. This resulted from the fact that balance of payments surpluses led to increases in the liquidity base while deficits were not generally allowed to lead to contractions of liquidity.

The authorities adopted a classic cash reserve system, whereby the central bank influenced the level of banks' cash balances by altering their cost (through changes in interest rates) rather than their level directly. This was a necessary result of the discount house system, under which banks could offset any attempt to reduce their cash balances by withdrawing call money from the discount houses; the discount houses in turn had virtually unrestricted access to accommodation at the Reserve Bank (Gidlow, 1995a).

Under this new system, short-term interest rates became the crucial operational variable of monetary policy. The authorities sought to control the growth of the money supply by using interest rates to limit the demand for money. This contrasted with the 'supply side' practices being followed at the time in the United States, United Kingdom and elsewhere, whereby the authorities sought to control the cash base directly. Control over interest rates was affected through the Reserve Bank's role as lender of last resort.

Since 1973, the interest rate charged for accommodation at the Reserve Bank had been linked to the current market rate for treasury bills. The bank was willing to rediscount treasury bills for discount houses without limit at 0.5% above the latest tender rate, for periods of 7 to 14 days. In addition, discount houses could obtain overnight loans on the security of short-term government stock at 2.5% above the tender rate.

The Reserve Bank abandoned this system in favour of bank-set and differentiated rediscount rates for eligible short-term securities in December 1983. The central role of the discount rate under the new cash reserve system heightened the need for direct control of the discount rate. Moreover, the mechanical link between the rediscount rate and prevailing market rates was seen to put upward pressure on interest rates. When the money market was 'in the bank', market rates tended to rise toward the bank's rediscount rate, which led, in turn, to an upward shift in rediscount rates leading to an upward spiral of rate increases.

The role of the discount rate as the focus of monetary policy was reinforced in 1985, when the Reserve Bank reintroduced the 'bank rate' as the basic rate for rediscounting treasury bills. The bank rate became the reference point for monetary policy and for the financial system generally. When banks are not making use of the discount window (not 'in the bank'), the bank rate defines the ceiling for the treasury bill rate. When the market is 'in the bank', the bank rate sets the floor for treasury bill rates and, more generally, for short-term interest rates throughout the financial system. In this way, the authorities are able to exert a significant degree of control over the level of interest rates generally.

In the course of the 1980s, accommodation policy changed fundamentally with the end of the special role of discount houses. Since their creation in the late 1950s and early 1960s, discount houses had served as market makers in short-term financial instruments and, more importantly, had become the principal conduit for provision of Reserve Bank accommodation to the banking system. Although both of these functions were endorsed by the De Kock Commission in its final report, other factors were leading to a secular decline in the role of the houses. The shift to a cash reserve system and the decline in liquid asset requirements had decreased the role of banks' call deposits with the discount houses. In addition, banks' money market operations increased in sophistication, with the development of an overnight market for bank loans to corporations and of an active inter-bank market.

From January 1985, banks were given direct access to the Reserve Bank accommodation in the form of overnight loans. In early 1989, recognising that the discount houses had ceased to provide an important conduit for accommodation, the Reserve Bank granted banks the same access to the discount window as discount houses (at the bank rate). Discount houses were brought under the Deposit-taking Institutions Act of 1990 and, in the early 1990s, were transformed into banks.

In 1993, there was another important change to accommodation policy when the Reserve Bank ceased to provide funds to the market by rediscounting treasury bills (at the bank rate), bankers' acceptances (at the 'bankers' acceptances' rate or BA rate) and other money market assets. Instead, it provided overnight loans on the basis of collateral in the form of treasury bills, Reserve Bank bills, Land Bank bills and government stock with remaining maturities of less than three months. The Reserve Bank offered a second tier at the discount window, accepting longer term government stock (up to three years) at a premium of 1.5 percentage points to the bank rate.

In order to exercise effective monetary control, the authorities needed to be able to compel banks to make use of the accommodation facilities at the Reserve Bank's discount window. It became the central aim of open market operations to create a money market 'shortage' that obliged banks to obtain refinancing at the Reserve Bank. This contrasts with the role of open market operations in systems such as that of the United States, where the aim is to achieve a targeted effect on the level of cash balances.

In contrast with their limited effectiveness under the liquid asset system in the 1970s, open market operations became a crucial instrument of monetary policy in the 1980s. Open market operations, in the traditional sense of purchases or sales of government debt instruments by the monetary authorities, increased markedly in scale in the 1980s. But, as discussed in more detail in the section below, such purchases and sales are just one of a range of instruments used by the monetary authorities to influence the money market shortage. The operational side of monetary policy focused on the use of these instruments with the aim of making the Reserve Bank's discount, or refinancing, policy effective.

The transition to the cash reserve system, which began in 1981/82, was completed only at the end of the 1980s. The cash reserve system enables the effective control of banks' cash balances only if one of two conditions is satisfied. One is that banks are restricted in their ability to convert other liquid assets into cash with the central bank. The other is that they are able to do so only at interest rates that are sufficiently high to curb demand for cash balances to the desired level. Since the Reserve Bank did not seek to control the supply of cash balances to the banking system, the effectiveness of the cash reserve system rested on the maintenance of an appropriate discount (or refinancing) rate so as to achieve the desired effect on banks' demand for cash balances. It is for this reason, as already noted, that the bank rate became the focus of monetary policy.

The pattern of real short-term interest rates over the period suggests that the second condition was often not satisfied in the first half of the period. Real interest rates were persistently negative for much of the 1980s, starting the decade at -9% (during the gold boom), reaching -7% in early 1983 and dropping to as low as -9% again in 1986.

Real interest rates turned consistently positive for the first time in July 1983, some five months after the abolition of the dual exchange rate system called the 'financial rand'. The termination of the financial rand effectively removed capital controls on non-residents. Although residents

remained subject to exchange controls for capital transactions, non-residents could now freely buy and sell South African securities and other assets. The link between this liberalisation of the capital account and the shift to positive real interest rates was underscored when the return to negative real interest rates in July 1985 was shortly followed by the re-imposition of the financial rand, in response to the debt crisis mentioned above.

In early 1988, real interest rates again turned positive and have essentially remained positive since that time. The shift to consistently positive real interest rates was consolidated in 1989, when Stals became governor of the Reserve Bank. Stals proceeded to maintain positive real interest rates through the recession of the early 1990s, which proved to be the most severe contraction in the post-war period. This marked the first time since the 1960s that positive real rates had been maintained during the downward phase of the cycle.

Table 15: Indicators of Financial Development prior to 1994

Year	M2/GDP	Bank Deposit/GDP (%)	Real interest rate	Inflation	Domestic Credit Private	Domestic Credit Government
1970	57.9		3.7	4.1	-	-
1975	57.1	0.56	0.6	12.5	14,873	3,092
1980	48.9	0.46	-10.2	13.7	29,655	3,763
1985	51.6	0.55	1.1	16.3	75,411	3,681
1990	51.1	0.54	4.7	14.3	168,341	6,366
1993	45.5	0.57	2.7	9.7	229,804	7,455

Source: World Bank and South Africa Reserve Bank Quarterly Bulletin

The shift to sustain positive real interest rates signalled the beginning of an inflation stabilisation effort by the monetary authorities. Given the strong orientation of policy toward monetary aggregates, it is perhaps unsurprising that stabilisation focused exclusively on the money supply rather than alternative nominal anchors. The authorities' continuing confidence in the centrality of monetary aggregates to the transmission mechanism, on the one hand, and the wide-ranging controls on the capital account of the balance of payments, on the other, ruled out the nominal exchange rate as a rival focus for stabilisation. The tightening of monetary policy reinforced by the deep recession led, from the middle of 1992, to a sharp and sustained fall in inflation (see Table 15).

3.3.8.2 Market-Oriented Policies Post 1994

After 1994, the Banks Act No 94 of 1990 was amended by the Banks Amendment Act No 26 of 1994 to the following effect: the SARB argued that in view of the opening up of international

trade with South Africa during the early 1990s and modern banking trends, such as the establishment of cross-border interests by banks and the need for reciprocal treatment by foreign and domestic supervisory authorities, that it was appropriate for the SARB to allow foreign banks to conduct the business of a bank in South Africa through branches. The Banks Act effectively prevented the establishment of branches by foreign banks (SARB, 1994: 63-64). Since the coming into effect of the Banks Act of 1990, 31 foreign banks opened approved local representative offices in South Africa.

The Banks Act provided for the establishment, by a foreign bank, of a representative office or branches of foreign banks in South Africa. Prior to November 1996 section 34 did not provide for the Registrar of Banks to obtain sufficient information from such representative office to enable him to discharge of his duties in terms of the minimum supervisory standards set by the Basle Committee on Bank Supervision. Stringent conditions to conduct the business of a bank by a foreign institution by means of branches were subsequently set out in the Government Gazette, first in 1996 and again in 2000 (Government Gazette, No. 17115 of 1996 and No. 21936 of 28 December 2000). The prudential requirements included that a foreign institution had to maintain a minimum net assets of US\$1 billion, or net assets of its own of (SARB, 1992) and this number increased to 33 in 1993 (SARB, 1993).

Furthermore the Act provided for the establishment, by a foreign bank, of a representative office or branches of foreign banks in South Africa. Prior to November 1996 section 34 did not provide for the Registrar of Banks to obtain sufficient information from such representative office to enable him to discharge of his duties in terms of the minimum supervisory standards set by the Basle Committee on Bank Supervision. Stringent conditions to conduct the business of a bank by a foreign institution by means of branches were subsequently set out in the Government Gazette, first in 1996 and again in 2000 (Government Gazette, No. 17115 of 1996 and No. 21936 of 28 December 2000).

The South African Department of Bank Supervision has actively contributed towards the activities of the Basle Committee on Bank Supervision and subsequently also became a signatory to the Core Principles for Effective Banking Supervision of 1997 (SARB, 1997). This was imperative given the proliferation of financial activities across and into the South African border, either by South African banks in other parts of the world, or by foreign banks entering the South African market.

The Core Principles were endorsed by the IMF and World Bank in 1997 and by the International Conference on Banking Supervision in October 1998. The Core Principles determined that banking supervisors had to have the authority to address compliance with banking legislation by institutions under their jurisdiction (SARB, 2005). New regulations were therefore passed in South Africa to compel representative offices of foreign banks to subject themselves to on and off site inspection to establish adherence to relevant legislation (Government Gazette, No. 22939, 2001).

3.3.9 Experience with the Reforms on Institutional Development

The changes in the Banks Act, No. 94 of 1990 paved the way for the internationalisation of South African banks. In the period 1994-2004 the number of foreign banks authorised to establish representative offices in South Africa rose from 31 to 61 in 2000, but then dropped to 46 in 2004. These representative offices did not engage in bank operations, but provided a presence for foreign banks interested in entering the market or supplying vital economic and trade information to clients. The majority of the foreign offices in 1992 were representative of European banks: seven from the Spanish speaking countries, seven from France, eight from Germany, two each from Britain and African countries, three from Switzerland and one from Israel (SARB, 1992). By 2000 banks from the USA, China, Japan, Taiwan, India Canada and Norway had joined the ranks of foreign representative offices in South Africa (SARB, 2000). The actual involvement in banking activities commenced with the permission to foreign banks to open branches in South African and conduct bank business in 1993. The number of branches of foreign banks rose from 4 in 1995 to 15 in 2004. The first banks to open branches were, ABN Amro Bank, Bank of Baroda, Citi Bank, Commerzbank Aktiengesellschaft, Credit Agricole Indosuez, ING Bank N.V. Morgan Guaranty Trust Company and Société Générale (SARB, 1997).

As a result of opening up the financial sector to the rest of the world, between 1993, when foreign banks' branches were permitted to conduct banking business in South Africa, and by 2004 the total assets of foreign banks' branches as a proportion of total assets of all banks operating in South Africa, increased by 31.5 percent per annum (

Table 16). This asset growth came off a low base, but nevertheless represented growth at a rate more than double the annual increase of the assets of all the banks, namely 15.2 percent.

University of Cape Town

Table 16: Bank Total Loans and Advances R'billion (1993-2004)

Year	Bank Total Loans & Advances	Foreign Bank loans and advances	Foreign as a % of total
1993	241	4	1.8
1994	284	5	1.7
1995	329	5	1.6
1996	393	16	4.2
1997	464	23	5.0
1998	539	30	5.6
1999	598	32	5.4
2000	656	39	5.9
2001	790	67	8.4
2002	883	76	8.6
2003	958	79	8.3
2004	1,104	97	8.7

Source: D1900 Bank returns to SARB

This impressive performance could be explained by the nature of the business of the foreign branches. These foreign banks' branches were primarily engaged in investment business to the corporate sector, which is the higher yielding business in the market. The major interest rate differentials between South African short-term as well as long term interest rates and the interest rates of her major trading partners (see Table 17), explain the strong incentive for foreign banking institutions to enter the lucrative market for corporate finance.

The democratic elections of 1994 marked the beginning of a new phase in monetary policy. The triggering factor behind the monetary policy shift was the transformation of the balance of payments position. South Africa experienced large, continuous outflows on the capital account of the balance of payments following the debt crisis of 1985. The political transition signalled by the elections led immediately to capital inflows. These new inflows had a direct impact on monetary policy, as the resulting increases in liquidity required much more active intervention by the authorities.

But it is the indirect impact of these inflows that has proved of lasting significance. The return to a positive balance of payments position has enabled the government systematically to liberalise the capital account, in parallel with a broader liberalisation of trade and other policies. The shift away from rationing in the foreign exchange market has, in turn, had three lasting effects on monetary policy. First, it has reduced the usefulness of monetary aggregates as intermediate targets of monetary policy, forcing a shift to a broader range of intermediate targets. Second, within that broadened range of intermediate targets, the shift to an open capital account has

heightened the importance of the exchange rate as an intermediate target. Finally, the shift has highlighted the limits of the discount window policy based on the bank rate as the reference point for monetary policy.

Table 17: Short Term Interest of South Africa & foreign banks, 1985-2005

Year	RSA	USA	Euro Zone
1990	18.59	8.15	9.52
1991	17.04	5.84	7.30
1992	14.4	3.68	5.36
1993	11.64	3.17	4.53
1994	10.96	4.63	3.31
1995	13.73	5.99	3.31
1996	15.35	5.39	3.33
1997	15.49	5.62	3.83
1998	16.72	5.50	2.97
1999	13.01	5.36	4.39
2000	10.11	6.45	4.26
2001	9.73	3.73	3.32
2002	11.59	1.70	2.34
2003	10.94	1.17	8.49
2004	7.60	1.57	9.25

Source: Bureau for Economic Research, University of Stellenbosch, Quarterly Reports

It is difficult to understate the change in the balance of payments position that occurred following the 1994 elections. Although the capital inflows since that time have been reversed on several occasions, notably during the rand crisis of 1996 and the crisis in Southeast Asia in the second half of 1997, the net inflows have been positive since 1994. (The shift from outflows to inflows was particularly pronounced in long-term capital flows. These flows accelerated in 1995 following the abolition of capital controls on non-residents.)

The shift towards liberalisation in the orientation of economic policy, which began in fits and starts during the early 1990s, became entrenched under the post-apartheid government. The stage was set for broad liberalisation by the 1993 agreement, undertaken by the transitional government preceding the elections, to a comprehensive ten-year programme of tariff reduction and simplification under the Uruguay Round of the General Agreement on Tariffs and Trade.

The reversal in the balance of payments position allowed the new government to embark on a broad programme of exchange control reform. The first major step came in March 1995, when the government announced the end of the dual exchange rate system called the 'financial rand'. Apart from an aborted attempt at reform in the mid 1980s, as mentioned earlier, the dual

exchange rate system had been in place since the early 1960s. Its abolition meant that capital transactions by non-residents were now free of restrictions. Barely four months later, the government embarked on a second major reform of exchange controls, and began to relax the controls on outward investments by institutional investors through an 'asset swap' mechanism. These controls were subsequently liberalised further, allowing such institutions to invest a certain fraction of their annual cash flow in foreign assets.

The March 1997 budget was widely regarded as signalling the final phase of liberalisation. Controls of foreign investment transactions by individual residents were liberalised up to a limit of R200,000, and those by companies up to a limit of R30 million (R50 million for investments into Southern Africa Development Community (SADC) countries). More generally, there was a shift in approach from a comprehensive set of capital controls on residents to a substantially liberalised regime in which only certain limited classes of transactions would remain subject to controls. Notably, the limit for registered capital account transactions with the Reserve Bank was raised from R2,000 to R40,000, a move that exempted more than 60% of previously registered transactions.

The key monetary policy challenge facing the Reserve Bank is how to manage the sharply higher volume and greater volatility of cross-border capital flows that have resulted from the political transition and the lifting of capital controls. The increase in volatility was underscored soon after the elections when the 1994 fourth quarter outflow of R1.1 billion was followed by an inflow of R5 billion in the first quarter of 1995, a swing equivalent to 1.5% of GDP.

The surge in capital inflows and the heightened volatility have had a direct impact on domestic monetary conditions. Underlying this linkage has been the commitment by the Reserve Bank to stabilise the real effective exchange rate, a commitment that has been a key element of Reserve Bank policy since the late 1980s. The bank has pursued this objective using a combination of large-scale foreign exchange intervention and open market operations to sterilise the resulting money creation.

3.3.10 Effect of Reforms on other Financial Variables Post 1994

The M2 monetary aggregate is usually defined as narrow money (M1) comprising transferable deposits and currency outside deposit money banks, plus quasi-money comprising time, savings and foreign currency deposits of deposit money banks. The ratio M2 to GDP can provide a measure of the size and depth of the financial sector and financial development. The ratio tends

in line with the development of financial systems; the range of savings instruments spreads and liquidity increases but will then tend to fall again as other non-deposit based forms of savings instruments develop. Table 18 shows the evolution of the ratio for South Africa over the 1994-2004 period.

Table 18: Indicators of Financial Development prior to 1994

Year	M2/GDP	Bank Deposit/GDP (%)	Real interest rate	Inflation	Domestic Credit Private†	Domestic Credit Government†
1994	45.2	0.58	5.5	8.9	268,926	15,487
1995	46.6	0.60	6.9	8.7	316,709	4,225
1996	47.5	0.61	10.3	7.3	367,213	21,190
1997	49.9	0.65	11.3	8.6	419,872	33,593
1998	53.2	0.69	13.1	6.9	489,893	42,275
1999	54.4	0.71	10.4	5.2	532,520	42,639
2000	52.3	0.71	5.2	5.3	590,063	42,086
2001	53.0	0.75	5.7	5.7	674,047	31,667
2002	51.6	0.75	4.7	9.2	703,381	58,194
2003	53.3	0.81	9.9	5.8	838,300	45,770
2004	53.6	0.87	5.2	1.4	954,024	42,643

Source: World Bank

† Figures are in millions of Rands

The ratio of M2 to GDP was volatile prior to 1994, averaging about 37 percent of the GDP. In the period since 1994 to 2002, this ratio has risen quite significantly and averaged 47 percent of gross domestic product. The ratio has risen at this time to reflect greater access and new entrants to the banking systems.

• The Ratio of Bank Deposits to GDP

The ratio of bank deposits to GDP provides an illustration of the extent to which local savings are being effectively mobilised. This ratio is typically very low in African countries; for example, in the case of Mozambique it represents only 22% of GDP. The trend in data between 1986 and 1993 clearly show that the ratio was volatile but maintained an upward trend averaging 54 percent. Thereafter it maintained an upward trend, averaging 61 percent in the period 1994 to 2004 (Table 18). It therefore suggests that since 1994, local short term savings have been better and more effectively mobilised than before.

- **The Ratio of Domestic Credit to GDP**

The private/public sector split of domestic credit can provide an indication of the role of the state in the financial and real sectors of the economy. Similarly, on the asset side, the ratio of domestic credit to GDP can give an indication of financial depth and the degree to which the formal banking sector plays a role in South Africa. Data in Table 18 shows the evolution of the ratio for the country. The ratio has been increasing since 1994.

During the 1970-80 period, total domestic credit as a proportion of GDP averaged 59 percent. The amount that was allocated to the private sector was 50 percent of GDP. State involvement (which attracted an average of 9 percent of total credit to GDP) was important in South Africa at this time, reflecting the risky investment climate in the country, the effect of sanctions and disinvestment, and the reluctance of banks to lend, given the already large non-performing loans to public enterprises of the banking system. Between 1980 and 1993, total domestic credit declined a little to 54 percent of the GDP. The ratio of private sector credit to GDP was 51 percent at this time. This reflects low government borrowing at this time. Since banking sector reforms accompanied economic liberalisation, total credit in the economy has risen since 1994. Between 1994 and 2002, total domestic credit increased to 62 percent of GDP. This increase is accounted for by increased extension of credit to the private sector (59% of GDP) especially taking into consideration that fiscal deficit decreased significantly from about 6 percent of GDP to just over 2 percent around this time.

3.3.11 Interest Rates Indicator of Financial Development

Developed financial systems should produce positive real interest rates that reflect peoples' positive rate of time preference and growth opportunities in an economy. This is an outcome of both neoclassical growth models and of more recent financial sector endogenous growth models. It is also a key argument of financial sector protagonists, like McKinnon and Shaw. In addition to being positive in real terms, interest rates should adequately reflect economic expectations. For example, nominal interest rates should be able to accommodate changes in expected inflation. Thus, both the level and flexibility of interest rates are essential.

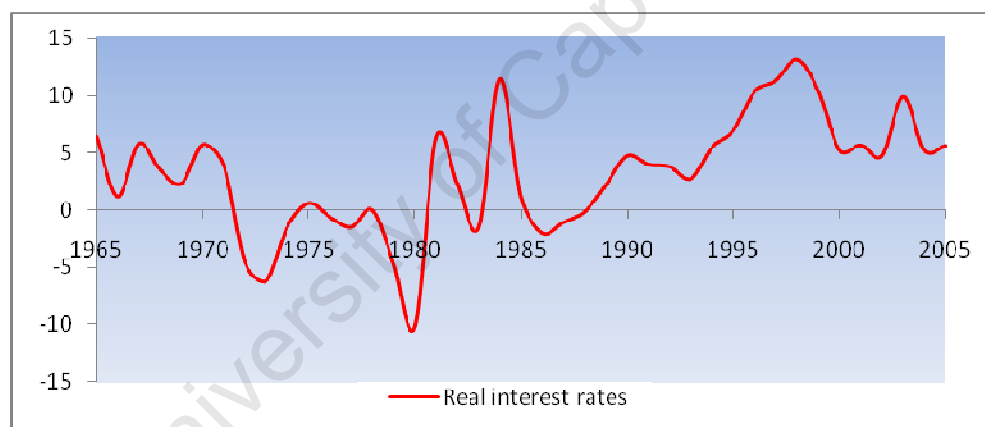
In lagging economies, returns are widely dispersed because of market fragmentation, with many projects yielding negative returns in real terms. As initial liberalisation leads to positive real interest rates, only projects with positive real returns are undertaken. Positive real interest rates

stimulate greater financial savings, significantly increasing monetisation of the economy and the degree of financial intermediation.

- **Real Interest Rate on Time Deposit in South Africa**

Throughout the 1970s and 1980s interest rates were fixed in the country and progress made towards liberalising interest rates began in the 1990s, and interest rates have been relied upon to a greater extent to conduct monetary policy. Strict interest rate controls provide nominal interest rate stability, but only at the ‘expense’ of real interest rate instability, if inflation is variable. The only way to achieve low nominal interest rate stability, without creating damaging real interest rate volatility, is to achieve a low stable rate of inflation. Market determined interest rates are often an early sign of financial sector reform and liberalisation. The real deposit interest rate is the most important financial market price. A fundamental precondition for substantial financial deepening is that it should be positive.

Figure 14: Real Interest rate



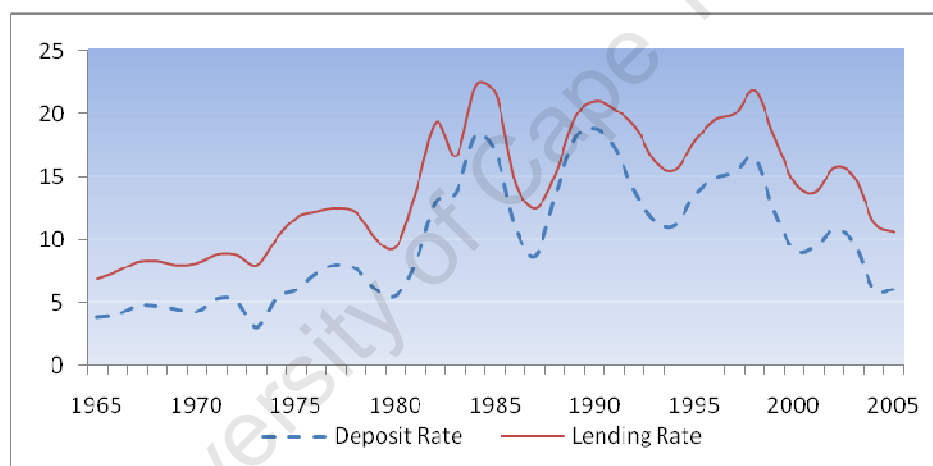
Source: South African Reserve Bank

Fragmented markets in lagging economies often produce negative real deposit rates, which discourage savings in financial assets. During the 1970-80 decade, the real interest rate was largely negative, averaging -3.94 percent. This followed a decreasing trend though it was still negative during the 1980-90 decade, averaging - 1.08 percent. This trend was reversed following South Africa’s successful political transition such that, during 1994 to 2001, real interest rates became significantly positive and averaged 5.6 percent (Figure 14). This might explain why long term deposits as a ratio of GDP has stabilised since 1994.

3.3.11.1 Interest Rate Spread

Real returns may reflect significant dispersion between interest rates because of information asymmetry and high transaction costs, a symptom of the poor physical, technical, tax, and regulatory infrastructure. The range of price dispersion decreases as the financial system develops. Development of mechanisms (like effective company and securities industry laws and regulations) to eliminate information asymmetry, creation of new institutions (like credit-rating agencies) to produce higher quality information, use of technology to improve the processing and dissemination of information (including prices), adoption of efficient business practices, and market organisation in the financial sector, together with ongoing deregulation, facilitate further development over time. Markets for complex financial instruments, like derivatives, that require a sophisticated infrastructure base, emerge as the development process progresses.

Figure 15: Trends in Interest rate spread



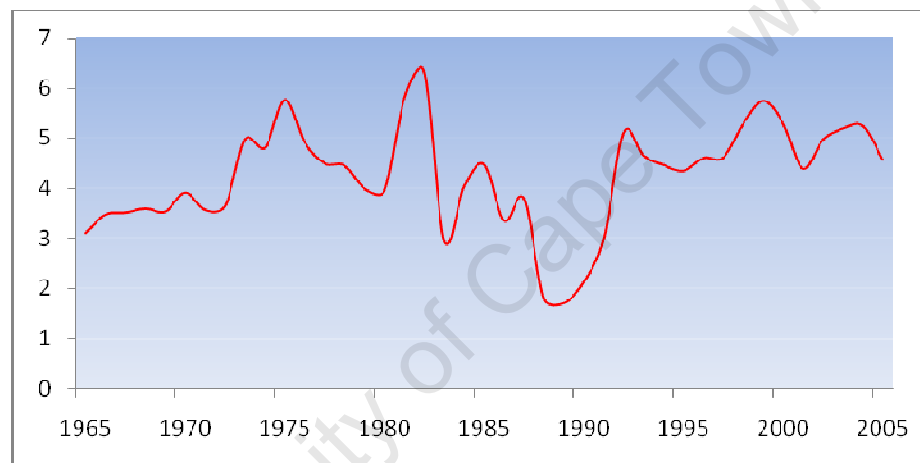
Source: South African Reserve Bank

Financial sector deregulation forms part of a wider set of economic reforms in lagging economies. Abolition of centralised controls over prices, resource distribution, and trade flows and the freeing of nominal interest rates and exchange rates fundamentally alter the economic and financial risk exposures of financial institutions and companies, generating a demand for effective risk management products that cover liquidity and price risk. Only advanced financial systems have the infrastructure to provide them. These risk management products also reduce price dispersion by linking markets across space and time.

3.3.11.2 Transaction Costs Indicator of Financial Development

Financial systems require low transaction costs (especially low credit intermediation costs) to support the optimal financial deepening and minimise the amount of scarce economic resources absorbed by the financial sector. Therefore, an important objective of financial sector development is the minimisation of the cost of collecting savers' deposits and transferring them to bank loan recipients, willing to pay a required return, with an acceptably low probability of default. Bank interest rate margins are often used to estimate them. Ideally, intermediation costs should take full account of interactions between bank operating costs and interest rate spreads, amongst other factors.

Figure 16: Trend in the spread of interest rates



Source: South African Reserve Bank

One would expect interest rate liberalisation to be seen in declining spreads between short-term deposit and lending rates, as spreads are an important indicator of competitiveness and efficiency of the financial (banking) system. In the case of South Africa interest rate spreads rose from about 3 percent in 1970 to about 8 percent in 1981 due to the oligopolistic nature of banks in South Africa (Figure 16). Following the lifting of control on interest rate ceilings in the early 1980s, interest rate spread became low and rose following the 1985 debt standstill and the biting effects of economic sanctions on the banking sector.

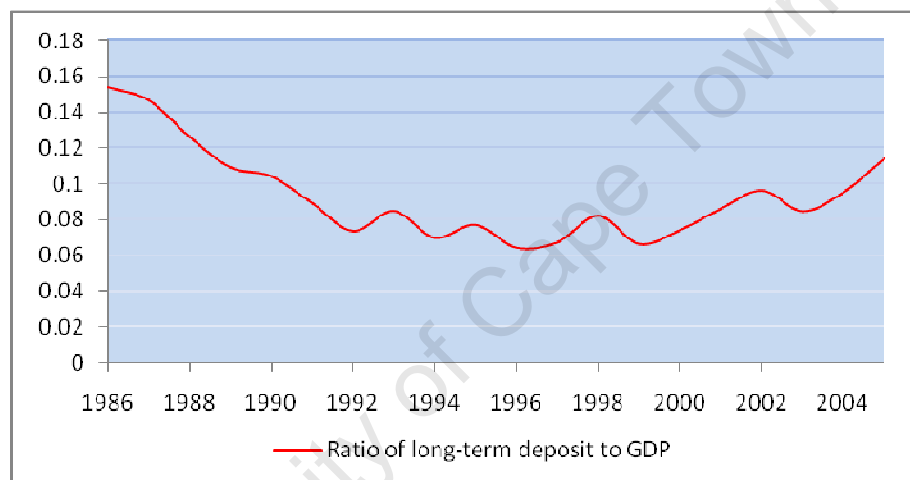
Following a series of changes in the banking sector in the 1980s which saw the withdrawal of Standard Chartered Bank and Barclays Bank from South Africa, and the sale of their assets to local banks, and the consolidation of local banks such as the Amalgamated Bank of South Africa, the interest rate spread became higher, averaging 4.03 percent between 1994 and 2002.

This is very much in line with the average of the interest rate spread (4%) during the 1985 and 1993 period and 3.9 percent during the 1970 to 1984 period. The entry of new banks and the introduction of financial instruments have not significantly impacted on interest rate spread in South Africa. This further amplifies evidence of domination of the banking sector by a few (four) big banks namely ABSA, Standard Bank, Nedcor and First Rand bank.

3.3.11.3 Long-Term Deposit to GDP ratio

The evolution of long term deposits in relation to GDP reflects the degree of confidence in the overall economy. The evolution of this ratio is captured in Figure 17).

Figure 17: Trends in the Ratio of long-term deposit to GDP



Source: South African Reserve Bank

There has been a declining trend in this ratio since the 1970s, reflecting the influence of political uncertainties. During 1979 and 1984, the ratio of long term deposits to GDP averaged 19 percent. From 1985 to 1993, this trend worsened as the ratio fell to 11 percent. Thereafter it stabilised at very low levels averaging 6 percent. Disinvestment thus took its toll on long term deposits in South Africa. This situation hasn't changed much since the advent of democracy and the ratio has actually levelled out at around 6 percent since 1994. This implies that whereas long term investors are still to commit strongly into the South African economy, the trend of disinvestment has been stemmed.

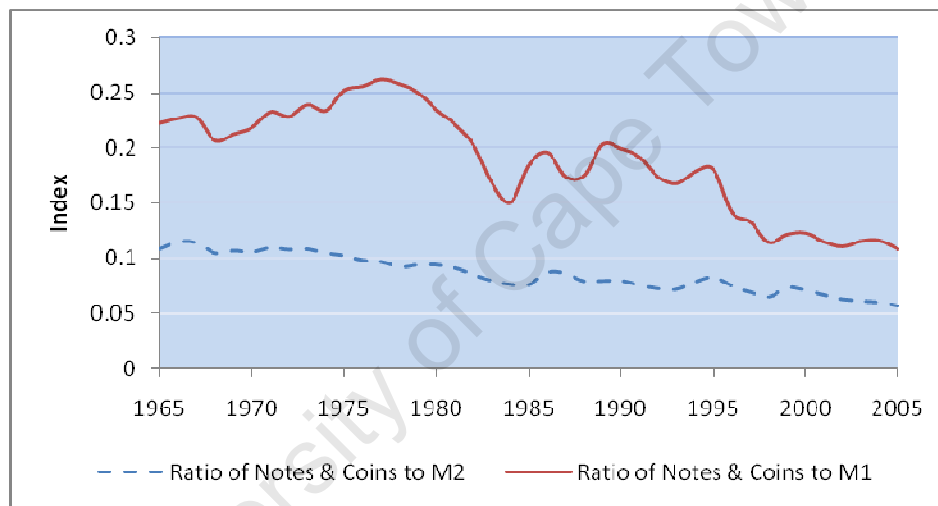
3.3.10.8 The Ratio of Coins and Notes to (M1) and (M2)

This quantity index is one of the measures that can be used to indicate the degree to which the financial sector is developed in terms of technology. In lagging economies this ratio is expected

to be high as financial sector development is low and economic and financial transactions are predominantly on 'cash and carry' basis. With increased development of the financial sector, there is increase in the use of cheques and electronic transfers and debit cards such that this ratio progressively declines and becomes low. This quantity index is therefore inversely related to the index of the degree of the electronic money which is discussed later.

Coins and notes as a proportion of demand deposit have been declining since the 1970s. As a proportion of M1, it declined from about 25 percent in 1979 to 14 percent in 1990. During 1985 to 1993, coins and notes represented 14.8 percent of demand deposit in the country. This ratio averaged 10 percent of M1 during 1994-2002 (Figure 18).

Figure 18: Trends in the Ratios of Coins and Notes to M1 & M2



Source: South African Reserve Bank

When the ratio of coins and notes to narrow money is expanded to include savings, the analysis extends to broad money and it is intended to examine whether the same trend is maintained. In lagging economies this ratio is expected to be high as savings are low and the financial sector is not sufficiently developed to provide instruments for attracting new and maintaining old savings. In the case of South Africa, coins and notes as a proportion of broad money has declined over this period. This suggests that the level of financial sector development in South Africa is deepening. In the 1985-1993 period, this ratio averaged 6.3 percent. The ratio fell to 5.2 percent during the 1994-2002 period.

3.3.11 Summary

This section has discussed financial development in South Africa during the 1965-2004 period, using various quantitative indices of measures of financial variables. It has been suggested that notes and coins are becoming progressively less important in relation to other measures of money and in the overall economy. This might suggest a move towards the cashless economy with its attendant implications for economic security for the poorer segment of South Africa who depend mainly on cash-based transactions.

There has been a trend of increasing credit allocation to the private sector as well as the ability of banks to extend mortgage loans. Short term savings have been better and more effectively mobilised than before, the exact corollary of the performance of long-term saving. The trend of disinvestment by long-term investors has been stemmed. Since democracy, limited efforts have been made to further develop the financial sector and the banking sector has been unsuccessful in introducing new non-deposit financial products to attract more savings from the wider population. The entry of new banks and the introduction of financial instruments have not significantly impacted on interest rate spread in South Africa.

3.4 Zambia

In the past four decades since independence, economic growth in Zambia's GDP growth has averaged 1.5 percent in the 1970s, 1.4 percent in the 1980s, and 0.3 percent in the 1990s before picking up in the early 2000s. Most of the poor growth results can be attributed to a combination of past government policy not being conducive to private sector growth, including the creation of a vast array of administrative barriers, and the resultant low levels of investment. In particular, this outcome reflects the decline in the mining sector, which has not been offset by growth in other sectors of the economy. Over the period (1964-2004), per capita GDP actually declined by an average 1.6% per annum.

This section examines how financial policies have shaped the evolution of the banking sector in Zambia since independence. The aim is to explore a number of related hypotheses. First, that interventionist policies were either ineffective in changing the way that banks allocated credit and/or had a negative impact on the strength of the banking system. For instance that interest rate controls led to disintermediation in conditions of high inflation when real rates were highly negative and that, attempts by government owned banks to extend loans to meet development objectives undermined their solvency, while administrative controls had little impact on the operational policies of the foreign banks which remained very conservative in their policies.

Second, that prudential regulation was not accorded sufficient priority with adverse consequences for financial fragility in the banking system, especially when locally owned private sector banks were set up in the 1980s and early 1990s. Third, reforms are difficult to implement effectively and probably have a limited impact on the efficiency of resource allocation by the banking system, especially in conditions of macroeconomic instability. The major constraints to improving efficiency are institutional in character and cannot be rectified quickly.

The rest of this section is organised as follows. Section 2 discusses briefly some macroeconomic developments in Zambia since it attained its independence from Britain in 1964. Section 3 details the main components of financial sector policies during the period of interventionist economic policies in Zambia, and assesses the impact of financial repression on the financial depth of the economy. A key facet of the government's financial policies was the establishment of a major government owned bank, the Zambia National Commercial Bank (ZNCB). The financial sector reforms which were started in the 1980s are described and assessed in Sections 4. Section 5 considers the liberalisation of financial markets and its impact on deposit mobilisation and allocative efficiency, while Section 6 examines the reforms which took place in the 1990s and thereafter assess their impact on financial development. Section 7 will discuss the conclusions of the thesis.

3.4.1 Economic Background

At independence in 1964, Zambia inherited a strong mining-based economy. It deteriorated in the mid-1970s following a sharp decline in copper prices, compounded by the oil shock. The country's failure to make positive policy changes in response to the declining economic environment further worsened the situation. Instead, foreign borrowing was increased to minimise the decline in living standards. Zambia recognised during these early years the need to diversify her economy and reduce over-dependency on mining exports. The preferred strategy was import substitution industrialisation that was import-dependent. This encouraged firms to produce for the domestic market but did little to build the requisite capacity to export. With little foreign exchange being earned amidst the entry during the 1990s of highly competitive consumer imports, the industrialisation strategy failed, leading to increasing unemployment (Situmbeko *et al.*, 2004).

The economic shocks after 1973 led to large declines in GDP. Between 1973 and 1984, real GDP fell by an average of 1.5 per cent a year. This was a total fall in real per capita GDP of 35 per cent (Bonnick, 1997). In order to overcome the rise in oil and other industrial import prices,

and the collapse of copper export prices, Zambia had to undertake heavy external borrowing. Total external debt increased from US\$800 million in 1970 to US\$3.2 billion by 1980 (World Bank, 2003). Most of this debt was owed to bilateral creditors. Long term multilateral debt was US\$400 million in 1980. This meant a rise in the ratio of debt to GDP from 43.7 per cent in 1974 to 94.7 per cent in 1977 (Bonnick, 1997). The debt crisis in Zambia meant it had to resort to more comprehensive programmes with the IMF and World Bank in order to gain access to the resources. Following negotiations beginning in 1981, an Extended Fund Facility with the IMF and Structural Adjustment Program (SAP) with the World Bank were agreed in 1983.

3.4.2 Other Macroeconomic Trends for Zambia Prior to Reforms

In the mid-1980s, per capita GNP in real terms was one-third less than in 1964 when Zambia became independent. The rate of inflation was about 15 percent per annum during the late 1970s, but picked up momentum and reached 50 percent in 1986. The balance of payments had been strained since the price of copper fell in the mid-1970s, but the pressure mounted over time. The foreign debt increased considerably and the government was not able to service it fully for a number of years. Arrears in payments had mounted, including payments to the IMF and the World Bank.

Furthermore, Zambia had suffered from a variety of exogenous shocks: deterioration in the terms of trade, harvest failures caused by drought, transport dislocations in the wake of Rhodesia's Unilateral Declaration of Independence, and military activities related to Zimbabwe's freedom struggle. Assessing the quantitative significance of all of these disturbances is not possible, but the impact of adverse terms of trade movements can be calculated.

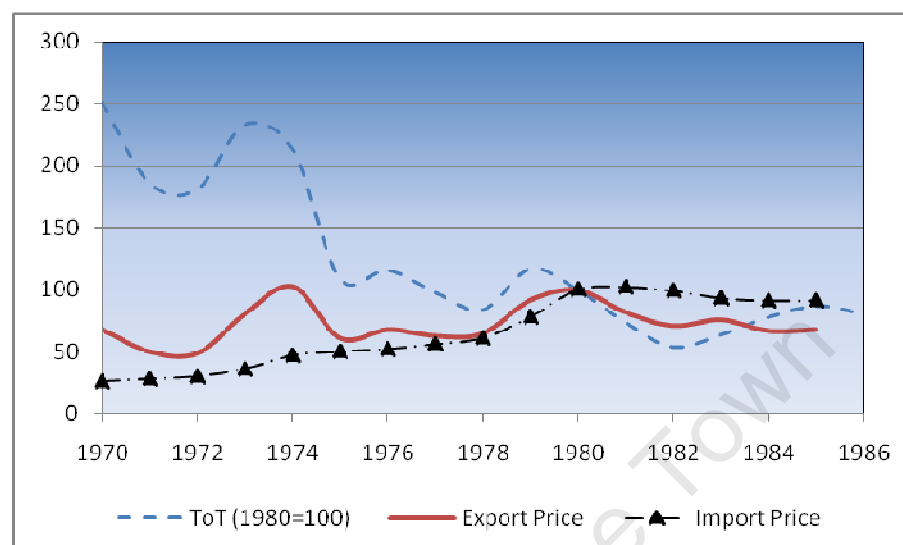
3.4.2.1 Terms of Trade

Zambia is almost unique in having one commodity, copper, play an overwhelming role in its exports. It supplies 85 to 90 percent of foreign exchange earnings, and Zambia is extremely vulnerable to the instability in world copper prices and to their recent very low level. On the import side, Zambia is typical of many oil-importing, low-income countries.¹⁰ The unit value of imports rose very sharply after 1973 and then again in 1979 as a result of the hike in energy prices. This index was also affected by the unprecedented inflation in OECD countries in the 1970s, and by the fact that exporters to Zambia charged increasing mark-ups on prices in

¹⁰ Capital goods accounted for 39 percent of total imports in the early 1970s, intermediates for 37 percent (petroleum 5 percent), and food for 10 percent.

anticipation of delays in obtaining payments. All these factors culminated in a disastrous deterioration in the Zambia's terms of trade during 1974-78 (see Figure 19).

Figure 19: Terms of Trade for Zambia

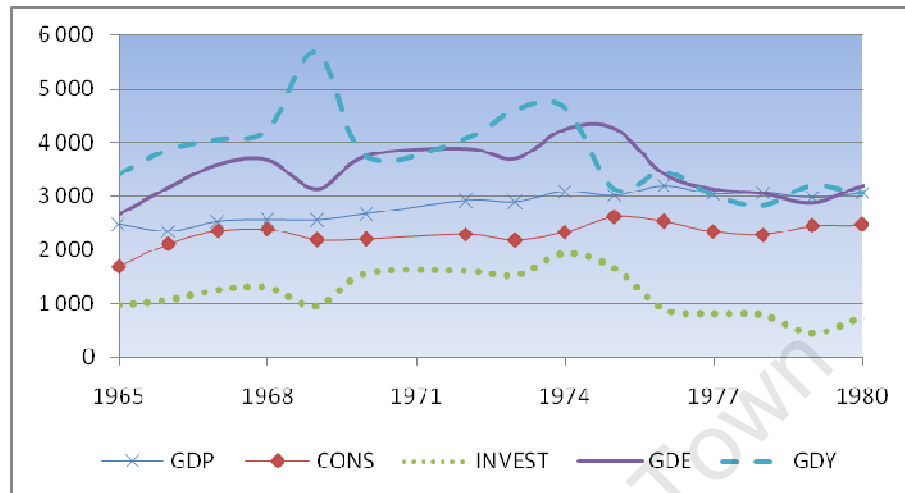


Source: World Bank Data files

Egregious policies (such as failures to use price mechanism in managing aggregate demand and in securing a sensible allocation of resources) compounded the devastating impact of exogenous shocks. The framework of incentives was distorted by the emergence of large gaps between 'efficiency' and prevailing prices, many of which were under government control. Many of these government interventions and the establishment of numerous parastatals, aimed at achieving well-meaning objectives, generated very serious adverse side-effects and led to large misallocation of resources.

Figure 20 provides a historical perspective of the management of aggregate demand. Political independence witnessed a massive increase in both consumption and investment. These expansions did not create any financial imbalances since GDY (total production adjusted for the terms of trade) exceeded GDE (consumption plus investment) up to 1970. The following year saw a major deterioration in copper prices. The surplus on the current account of the balance of payments was eliminated. Terms of trade losses beginning in 1975 (see Figure 19), which persisted throughout the rest of the decade, created a very difficult policy problem.

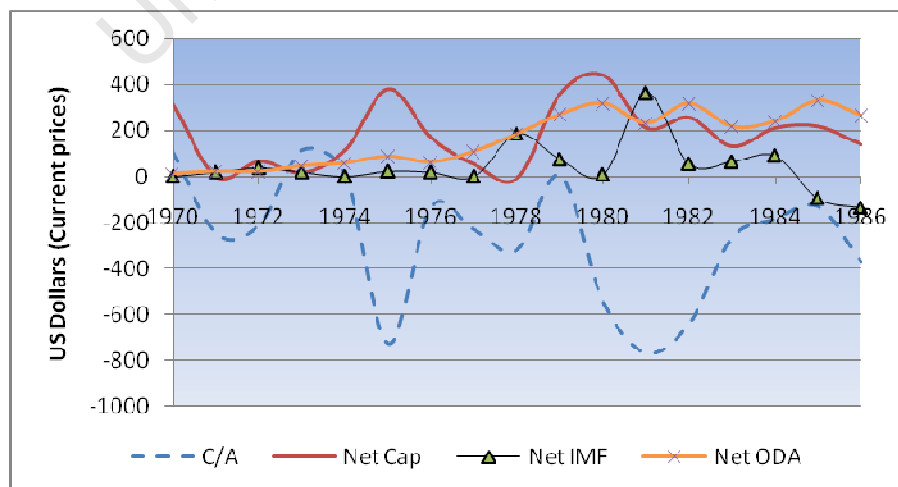
Figure 20: National Account Indicators¹ (1960-1980)
Million Kwacha (1980 Prices)



- Gross domestic expenditure (GDE) = total consumption + investment.
- Gross domestic income (GDY) = gross domestic product (GDP) plus/minus gain/loss due to changes in terms of trade.
- *Source:* World Bank (1987b).

The government had to make a strategic choice between restoring financial balance by curtailing aggregate demand and maintaining the level of demand by resorting to extraordinary sources of finance. GDE was reduced significantly, mainly by curtailing capital formation. This did not restore financial balance, however. Zambia had to borrow on hard terms from foreign commercial banks and supplier's credit agencies (see Figure 21). It also had to draw on the IMF.

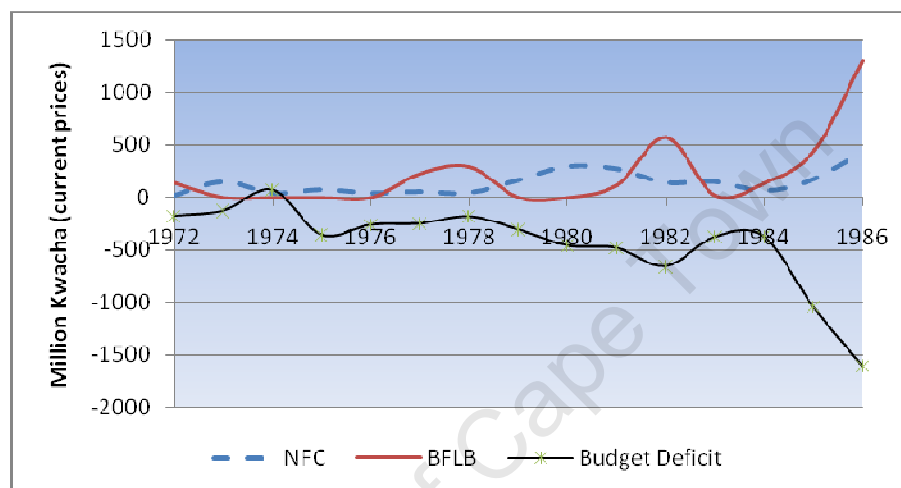
Figure 21: Balance of Payment Indicators, 1970-1980



Source: Government Finance Statistics Yearbook. IMF (various years)

The same problem of financial imbalance in the context of the government budget is portrayed in Figure 22. In 1975, budget deficits started becoming very large. The government borrowed heavily from the domestic banking system in 1977 and 1978. Such borrowings averaged 10 percent of GDP in 1975-79, compared to 3 percent in 1970-74. Correspondingly, inflation, measured by the cost of living index, rose at a rate of 16.5 percent per annum during 1975-79, compared to 5.6 percent per annum in the earlier period.

Figure 22: Budget Deficit and its Financing, 1972-86



- NFC is Net Foreign Capital (including grants) which comprises borrowing from foreign governments, international development institutions, and other foreign borrowing (see line DIII of source).
- BFLB is Borrowing From Local Banks and is the total of government borrowing from deposit money banks and monetary authorities of central government. It is in a net basis.
- Budget deficit of central government = total expenditure - current revenue (excluding grants).

Source: Government Finance Statistics Yearbook. IMF (various years).

By the late 1970s, this pattern of adjustment and financing had left Zambia with an onerous legacy of over-indebtedness and rapid inflation. Clearly, the government had mismanaged demand. It had made judgments about economic prospects, particularly about the recovery of copper prices that had turned out to be wrong. The strong preference for reducing investment rather than consumption had left in its wake a host of problems in the real economy, namely, delays in replacing old assets and postponement of needed new projects.

Managing aggregate demand in an environment of instability was not easy. Zambia's exports, for example, fluctuated on average by 13 percent per annum from trend during 1965-79. Furthermore, since policymakers' predictions could not be accurate, calculating the trend line *ex-*

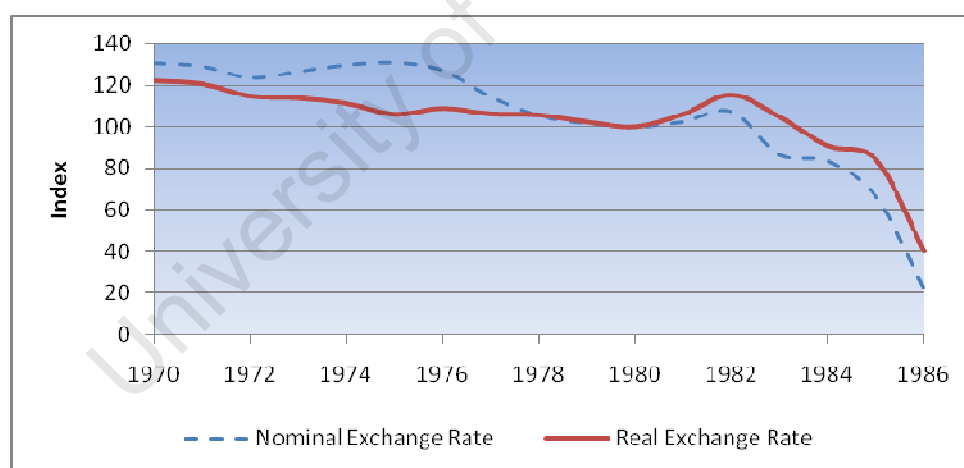
ante was extremely difficult. For example, World Bank projections of international copper prices turned out to have sizeable errors.

These difficulties, notwithstanding, Zambian policymakers had to choose between contra-cyclical reserve management and a stance of letting the terms of trade dictate the state of the economy. The evidence is that they did not (or could not) insulate the economy from the marked fluctuations in export revenues. During 1966-81, the simple correlation coefficient between exports and imports was 0.65 and that between exports and reserves was 0.08. Windfall gains in the years of export boom were not used to augment reserves; instead they spilled over into extra imports. Simulations suggest that import instability caused partly by export fluctuations could have been reduced by 50 percent if policymakers had managed reserves contra-cyclically using the simple extrapolation method of determining export trends.

3.4.2.2 Price Controls

The government displayed a strong preference for administrative controls, as against price policy instruments, both in managing aggregate demand and in allocating resources.

Figure 23: Nominal and Real Effective Exchange Rates (1970-86)



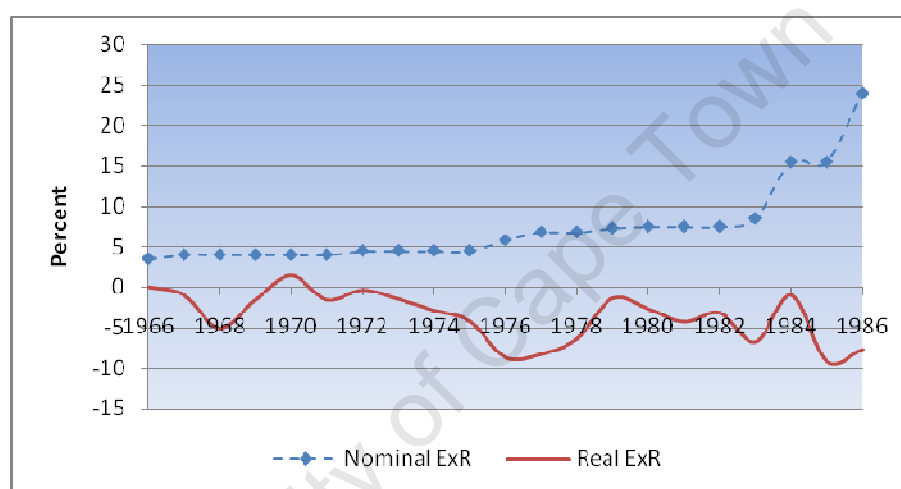
Source: Bank of Zambia

Throughout the 1960s and the 1970s, Zambia had a passive exchange rate policy. The kwacha was pegged first to the U.K pound and then in 1971 to the U.S. dollar. In 1976, the currency was devalued by 20 percent and pegged to the SDR. Another devaluation of 10 percent followed in 1978. These moves brought about a depreciation of the real effective exchange rate by about 20 percent during the 1970s (see Figure 23). Despite this depreciation, the government had to rely more and more on import bans, quantitative restrictions administered by the Ministry of

Commerce and Industry, and administrative allocation of foreign exchange by the Bank of Zambia. These arrangements proved to be time consuming and contributed significantly to the misallocation of resources. The problem of rationing foreign exchange became even more difficult in the early 1980s when the kwacha appreciated in real terms.

Prior to the financial reforms, the entire structure of interest rates was controlled by the Bank of Zambia and changes were infrequent. Deposit rates, for example, remained in the 3 to 5 percent range up to 1975, and then moved up slowly to 7 percent by 1980 (Figure 24).

Figure 24: Nominal and Real Interest Rates on Commercial Bank Deposits (1966-1986)



Source: IMF data (Developing Country Studies Division, Research Dept)

In real terms (that is, after deflation by the consumer price index), interest rates were actually negative in many years, thereby penalising savers. Interest rates had very little impact on the allocation of credit. After the government's financial position deteriorated sharply following the decline in the price of copper, the Bank of Zambia had to accommodate government needs and restrict credit to the private sector. Monetary policy became hostage to the budget deficit.

3.4.2.3 Foreign Exchange and Credit

The price of foreign exchange and credit remained too low during this period, necessitating their rationing by administrative means. As might have been expected, these misalignments meant that Zambian economic development tended to be both capital and import intensive.

Import intensity had deep historical roots. In the pre-independence period, a high level of imports reflected plentiful export earnings, predominantly from copper. In the early 1960s,

exports of goods and non-factor services (GNFS) constituted 58 percent of GDP and imports (GNFS) averaged 42 percent. Zambia was a very 'open' economy and the very attractive copper prices (in real terms) of that time yielded substantial rents, permitting relatively high levels of imports. More than a quarter of these imports consisted of consumer goods. The remaining imports were divided more or less equally between capital and intermediate goods.

As the balance of payments came under pressure, sustaining these high import levels became increasingly difficult. Sharply raising the price of foreign exchange by engineering a substantial real depreciation of the kwacha would have sent a clear, strong signal throughout the economy to economize on imports and to develop new export items. This did not occur. Imports contracted moderately and in a haphazard manner. There was little incentive to diversify the structure of exports and copper exports could not be sustained. The reduction of the import ratio between the early 1960s and 1978-80 was only 3 percent while the export ratio fell by 18 percent.

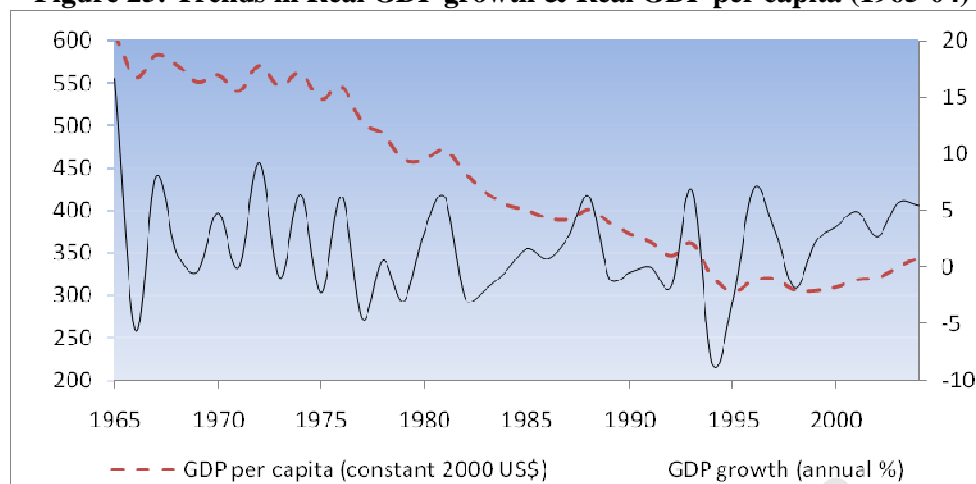
3.4.3 The First Structural Adjustment Programme

The 1980s marked the first phases of implementing Structural Adjustment Programmes (SAPs) amidst a stagnating economy. The implementation was, however, often piecemeal and failed to fundamentally alter the economic structure. In particular, the design and implementation of SAP often failed to sufficiently address the poverty challenges that increasingly became evident as the structural changes took hold. GDP growth in the 1983-86 adjustment period was zero, inflation rose and the budget and trade deficits widened (Bonnik, 1999). The World Bank argued that "inflationary pressure continued to build since the expenditure-switching expected from the exchange rate policy was not adequately supported from both the monetary and public sectors via tight monetary and fiscal policy. As such reductions in absorption could not filter through to supply-side effects operating through exports" (World Bank, 1994). In other words, there was high government budget deficit which was not resolved by stringent monetary policy.

Structurally, Zambia's economy has changed little in spite of the above changes and consistent high economic growth has been elusive. Over the period 1980 to 1990, the country's economic growth was the second lowest in the Southern African Development Community (SADC).

Over the period 1990 to 1990, it had the least average annual growth rate in the SADC region at one percent. This was also below the sub-Saharan Africa rate of 2.4 percent. Consequently, real per capita GDP has shown a downward decline over the years since independence (**Figure 25**).

Figure 25: Trends in Real GDP growth & Real GDP per capita (1965-04)



Source: World Development Indicators: online data

The major failure of economic policies in Zambia has been the inability to diversify the export base of the country from copper to other commodities. When copper prices therefore plummeted in 1975, it resulted not only in lower export revenues but also in substantial losses in public revenue and in general output.

The policy responses to this crisis were inadequate. In the face of lower foreign exchange availability, the government borrowed heavily from abroad in the belief that the crisis was temporary (FSDP, 2004). Since Zambia was in the medium income category then, it borrowed from the multilateral institutions such as the World Bank and the IMF at non-concessionary terms. This is how the country came to find itself as one of the most indebted and poor in the world, owing about \$6.3 billion or \$741 on per capita basis. This was about 2 times the size of the GDP. Since about half of her debt was to the multilateral institutions whose terms were not renegotiable, Zambia found itself in a position it could not renegotiate the debt repayment.

Another inadequate response to the balance of payments problems was in the foreign exchange rate management area. In the 1970s and 1980s, many developing countries did not accept the exchange rate as a potent instrument for balance of payments policy. This was due to the belief that devaluing a currency merely increased inflation without substantially improving the balance of payments situation. This view was also held in Zambia.

With a fixed exchange rate and rising domestic inflation, it was not long before the currency became overvalued. This combined with the industrial policy then that encouraged import substituting industries, quickly led to the mushrooming of industries that were capital intensive

and dependent on imported raw materials. In turn, this deepened the foreign exchange crisis further. Rationing of foreign exchange was made even harder and probably more subjective as well. Firms complained that they were operating at very low capacity due to limited foreign exchange availability. Others threatened that they would lay off workers.

In the midst of this, economic growth was mostly elusive and when it occurred, it was not sustainable. The black market in both foreign currencies and commodities flourished. This economic environment worked to the benefit of rent seekers rather than producers, thereby intensifying the distortions against production. By 1985, the authorities came to the conclusion that the system had become moribund and that it required drastic action to reform it. This is how the reform program of 1985 to 1987 came into being.

3.4.4 Financial Policies (1964-1991)

After attaining independence in 1964, the Zambian government practiced an interventionist approach to the economy which involved nationalisation of companies such as mines and other manufacturing institutions. The nationalisation process begun in 1968 with 28 companies, and this was followed by the policy of nationalising the mining sector in 1969 (Fundanga *et al.*, 1997; White, 1998). The above strategy, motivated by economic nationalism and the desire to redress political and economic inequalities, entailed state led import substituting industrialisation and extensive government controls over resource allocation.

Despite the above reforms, economic performance however was very poor it was severely affected by the steep fall in the price of copper from the mid 1970s, while the interventionist policies led to inefficiencies and structural rigidities which impeded adjustment to external shocks. A series of IMF stabilisation programmes were implemented, beginning in 1976, in an attempt to tackle the economic crisis, but, apart from a short period during 1985-87, the government persisted with the main components of the interventionist strategy until the late 1980s/early 1990s (Fardi, 1991; Jones, 1994). The financial system in the mid 1960s was dominated by foreign commercial banks which mainly served the interest of foreign and expatriate businesses. The general thrust of financial policies after 1968 was to enable government to exert greater control over the financial system and to ensure that credit allocation was more supportive of the government's overall economic strategy. Financial policies consisted of three main strands: nationalisation of foreign financial institutions, establishment of government owned banks and development finance institutions, and administrative controls over interest rates and, to a limited extent, loan allocation.

3.4.4.1 Repression of Financial Sector

With respect to the financial sector, the banking sector was not severely repressed. Instead of nationalising the banks, the government did create its own three banks including Zambia National Commercial Bank (ZNCB) which was established by the government in 1969. Because ZNCB had the monopoly over all the banking business of parastatals it became Zambia's largest commercial bank in terms of assets (Fundanga *et al.*, 1997). Its objectives included the provision of credit to Zambians and the extension of bank branches into the rural areas (Musokotwane, p 12). The government however realised that ZNCB was not going to manage to expand rapidly enough to meet the expectations placed on it, and in 1971 announced plans to nationalise all the foreign financial institutions, including the commercial banks (Harvey, 1991).

The aim of nationalisation was to control the economy and to prevent capital flight (Mwanawina *et al.*, 2002). Most of the non bank financial institutions were nationalised and amalgamated to form financial parastatals such as the State Insurance Corporation and Zambia National Building Society (Musokotwane, pp 8-9). But with one exception the banks were never nationalised because the owners threatened to withdraw their expatriate management and the Zambian government was not convinced that it could manage the banks without them (Harvey, 1993).

Instead, several other banks and non bank financial institutions were set up by the government to serve various purposes. For instance, Indo-Zambia Bank was established in 1984 as a joint venture between the government and three state owned Indian banks, and in 1987 the Zambia Export and Import Bank was founded to supply trade finance. Development finance institutions were set up to provide concessional and/or long term finance to priority sectors with funds mobilised from the government or external sources. These included the Zambia Agricultural Development Bank and Agricultural Finance Company, which were amalgamated to form the Lima Bank in 1987, and the Development Bank of Zambia.

3.4.4.2 Interest Rate and Other Administrative Controls

The third strand of the government's financial policies consisted of the imposition of administrative controls over financial institutions. By the end of the 1970s an all embracing system of controls had been constructed, with price controls for major commodities, government intervention in credit allocation through the Zambia National Commercial Bank, import controls (as foreign exchange currency became scarce after 1975) and an overvalued exchange rate with consequent foreign exchange rationing (White, 1994).

With the exception of interest rates however, direct administrative controls over resource allocation in the banking system were not extensively employed by the government. This could have been due to lack of detailed sectoral credit guidelines, for example. However, the government did attempt to channel more credit towards Zambians by requiring banks to seek permission from the Bank of Zambia (BOZ) before lending to foreign companies and by imposing lower maximum gearing ratios on foreign borrowers than Zambian borrowers. This failed to induce a major expansion of lending to private sector Zambians, and in an attempt to rectify this, the government established a credit guarantee scheme for small scale industries in 1987 (Musokotwane, pp 20-24).

The lack of more extensive administrative controls to direct the pattern of bank lending was probably for two reasons. First, foreign exchange controls already provided the authorities with a powerful tool for directing resource allocation in the economy. Given the severe constraints on foreign exchange availability, firms with access to foreign exchange would generally have been creditworthy borrowers while those without would not: hence foreign exchange allocation exerted indirect influence over credit allocation and obviated the need for more direct credit controls. Second, given the weaknesses of the domestic private sector, the bias against agriculture in pricing policies and the economic crisis which afflicted Zambia from the mid 1970s, banks would almost certainly have had great difficulty in identifying creditworthy borrowers had they been instructed to lend to those sectors favoured by government rhetoric, notably agriculture.

To further the objectives of extending banking into rural areas the central bank of Zambia (BOZ) imposed a requirement on the commercial banks that, after their first four branches had been established along the line of rail, any establishment of additional branches for the bank along the line of rail was to be accompanied by opening up of a rural branch (Musokotwane, pp 20).

Beginning in the mid 1960s, the deposit and lending rates of the commercial banks were controlled by the BOZ which maintained a policy of low interest rates in order to minimize borrowing costs. Until 1984 commercial bank deposit rates were held within a range of 3.5 per cent and 8.5 per cent and lending rates between 7 per cent and 13 per cent (Musokotwane, pp 33 and 55). In addition a preferential rate was stipulated for agricultural lending from 1978. Nominal rates were generally held below the rate of inflation, which averaged 10 per cent during the 1970s and 20 per cent during 1980-84 (Table 19).

Table 19: Nominal interest rates and inflation

Year	Treasury Bill Rate	Savings Deposit	Lending Rate	Inflation
1970	3.1	3.5	7.0	2.2
1975	4.0	4.0	7.5	10.1
1980	4.5	7.0	8.5	11.7
1985	13.2	14.8	19.2	37.4
1990	26.4	23.5	37.5	109.5
1991	38.5	31.5	44.5	93.4
1992	46.5	41.5	55.8	191.3
1993	135.1	78.9	116.6	187.1

Source: Musokotwane (n.d.: 55 and 57); IFS

There was an increase in both inflation and nominal interest rates from the mid 1980s onwards. The implementation of a stabilisation programme led to a small rise in administered interest rates in 1984 and the decontrol of interest rates and introduction of a Treasury bill auction in September of the following year. Lending rates rose sharply thereafter – to around 30 per cent in 1986 – although because this was accompanied by an acceleration of inflation real interest rates remained negative. Interest rate controls were re-imposed in May 1987 following the breakdown of an IMF supported adjustment programme, and held below 20 per cent for the remainder of the decade. The government adopted a new IMF supported adjustment programme in 1989 under which interest rates were again raised, although they remained far below prevailing inflation rates which had by this time reached levels in excess of 100 per cent per annum. During the 1990s interest rates were again raised and then liberalised (Mulaisho, 1994).

3.4.5 Financial Liberalisation

A full structural adjustment programme was introduced between 1983 and 1987. Through it the bank reforms were also implemented in 1985 and these involved liberalisation of interest rate, reduction in subsidies and elimination of price controls (White, 1994). The most fundamental of these reforms involved removing controls on foreign exchange allocation in preparation for action system. Although as argued by White (1994), the auction system only accounted for about one fifth of total forex transactions, this rate was taken to be the official rate and resulted into a depreciation of the local currency from K2.2 per dollar prior to the introduction of the action system to K21 per dollar shortly before the action system was suspended.

The action system was blamed as the cause of higher inflation and that it allowed the rich to benefit by importing goods which ordinarily people could not afford. This also culminated into food riots as the government sought to remove the subsidies on food. Due to pressure from the

people, the government backed down, paving the way to the formal abandonment of reforms in 1987. The forex auction was abolished and the Kwacha was fixed to the revalued rate of K8 to the dollar and administrative allocation mechanism called FEMAC introduced. Furthermore, other administrative controls on prices and interest rates were re-imposed (White, 1994).

In addition to the exchange rate reforms, prices for food products were liberalised in 1983, some of the subsidies were suppressed, urban wages were blocked, and recruitment in the public sector was halted. In 1985, further measures were taken in the sphere of international trade: import quotas were lifted, and tariffs were aligned on international standards. However, the government stopped this first attempt at liberalising the economy on May 1, 1987, in response to serious civil unrest. A new attempt at liberalising prices was conducted in 1989, also resulting in urban riots. Further liberalisation only occurred after 1992, when the new government took over power.

3.4.5.1 The Impact of Initial Reforms on Financial Development and Growth

Until the second half of the 1980s negative real interest rates did not have adverse effects on the financial depth of the economy – the M2/GDP ratio increased from 29.2 per cent in 1970 to 34.6 per cent in 1984 – probably because they were not sufficiently negative to provide a serious deterrent to the holding of monetary assets. In addition foreign exchange controls prevented the major institutional actors in the economy (most of which were the parastatals) from holding foreign currency as a substitute for domestic financial assets (Adam, 1995). From the mid 1980s onwards however inflation accelerated, averaging 68 per cent during 1985-90, and this led to much more sharply negative real interest rates. By the end of the 1980s the economy's financial depth was diminishing rapidly: the M2/GDP ratio fell from 33.7 per cent in 1988 to 21.5 per cent in 1990 (see Table 20).

Table 20: Indicators of financial development in Zambia (1970-1993)

Year	M2/GDP	Bank deposit/GDP
1970	29.2	20.3
1975	31.2	24.2
1980	29.6	24.3
1985	29.7	24.8
1990	21.5	17.4
1993	14.2	11.0

Source: International Financial Statistics

With respect to growth of the economy, the system of controls did not help revive growth, as inflation remained high (at an annual rate of 37 percent in 1985 and 109 percent in 1990) real

GDP per capita continued to decline from US\$391 in 1985 to US\$361 in 1990 respectively). In addition to the deterioration in economic performance, poverty among households increased markedly with those households below the poverty line increasing from 49 percent in 1980 to 67 percent in 1991 (Mutukwa *et al.*, 1994). During the first part of 1989 as a prelude for resumption of talks with the IMF and World Bank undertook some reforms which included: food coupons to reduce the cost of food, 63 percent devaluation of the local currency and decontrol of many prices (White, 1994).

3.4.6 Financial Reforms (1991-2004)

Apart from the relatively short period from September 1985 to May 1987 when interest rates were temporarily decontrolled, financial sector reforms have only recently been implemented. Financial reforms have comprised two main components: financial liberalisation which included the liberalisation of foreign exchange markets and interest rates in 1992-93, and reforms to the system of prudential regulation and supervision of financial institutions, which included the enactment of new banking legislation in 1994. A third component was the de facto liberalisation of access to banking licences which enabled the number of local banks to expand rapidly during 1991-94, although to what extent this was a deliberate policy decision is unclear. The reforms have not yet included measures to restructure distressed public sector banks, but given the scale of ZNCB's non performing loans, this is likely to be necessary in the near future. This and the following section examine the financial reforms implemented in Zambia and present an assessment of their efficacy (which must inevitably be very tentative given that the reforms are so recent). Financial liberalisation is discussed in this section while in the following section we examine the reforms covering the period 1991-2004.

Financial liberalisation was undertaken in Zambia in conditions of acute macroeconomic instability. Central bank financing of a very large fiscal deficit led to a 95 per cent increase in broad money and a consumer price inflation rate of 93 per cent during 1991. Interest rate controls during 1991 limited the maximum lending rate to 46 per cent and the savings deposit rate to 33 per cent: hence real interest rates were substantially negative. Although the fiscal deficit was reduced in the following year, inflation accelerated to 193 per cent by the end of 1992.

3.4.6.1 Interest Rates

The financial policy objectives of the government in 1992 were to reduce inflation and to move towards positive real interest rates. Interest rate controls initially remained in force but interest

rates were adjusted upwards: the maximum lending rate was raised to 53 per cent by June 1992. Meanwhile a market determined exchange rate was introduced, with foreign exchange controls substantially liberalised and banks allowed to deal in foreign currency: this led to a sharp depreciation of the exchange rate during 1992. In September 1992 bank interest rates were decontrolled, and a Treasury bill auction was introduced in January 1993 which allowed Treasury bill rates to be market determined (White, 1994). The latter brought about a steep rise in treasury bill rates – 91 day treasury bill yields rose from 47 per cent in December 1992 to 181.8 per cent in June 1993 – and this pushed up bank deposit and lending rates: savings deposit rates rose to 78.9 per cent and lending rates to 116.6 per cent in 1993 (see Table 19). Inflation and nominal interest rates began to subside in the second half of 1993 after the government adopted a cash budget for its primary expenditure (i.e. all expenditure other than debt servicing). The inflation rate was reduced to 100 per cent and the 91 day Treasury bill yield fell to 85.4 per cent in March 1994 (White, 1994).

The objectives of financial liberalisation include boosting deposit mobilisation and enhancing the efficiency of credit allocation. Liberalisation did not boost deposit mobilisation: deposits as a percentage of GDP fell from 17.9 per cent in 1991 to 10.4 per cent in 1994, although they had been on a downward trend since the late 1980s. One of the reasons why financial liberalisation failed to halt the trend towards financial shallowing in Zambia was probably that the removal of foreign exchange controls allowed economic agents to legally hold foreign currency assets. Bank deposits may also have been diverted into treasury bills as Treasury bill yields surpassed bank deposit interest rates during 1993 and 1994 (Adam 1995). Higher deposit rates would have made domestic currency deposits more attractive to savers than they had been prior to interest rate liberalisation, but they remained well below the rate of inflation until 1994. Relative to alternative financial assets, liberalisation probably made bank deposits less attractive to savers in Zambia.

It is not clear whether liberalisation enhanced the efficiency of credit allocation in the banking system. The combination of very high nominal lending rates and inflation greatly increase the risks of bank intermediation for both the banks and their borrowers, making it likely that both loan demand and the willingness of banks to supply credit will be curtailed (Harvey and Jenkins 1994). Evaluating loan applicants is especially problematic in such conditions, so that even if liberalisation allowed banks to adopt more explicitly commercial criteria in allocating and pricing credit a more efficient allocation of credit would not be guaranteed. In addition the

volume of creditworthy borrowers to which the banks could lend was limited, especially because the formal sector was still dominated by parastatals, many of which have experienced acute financial difficulties.

There is a case for arguing that financial liberalisation was premature, and that it should have been delayed until the fiscal deficit and monetary growth had been brought under control. The arguments for this are twofold. First, lower nominal interest rates would have reduced the risks of loan defaults by borrowers, and by implication helped to protect the loan portfolios of the banks. Second, if liberalisation did undermine the monetary base and therefore increase the velocity of circulation of money by inducing agents to substitute non monetary for monetary assets, reducing inflation would have been made more difficult and would have required a greater deceleration in the growth of money supply, and therefore imposed a larger burden on fiscal contraction (Adam 1995).

3.4.6.2 Exchange Rates

Zambia has, for most of the time, followed a fixed exchange rate regime except for the period between 1985 and 1987 when the exchange rate was determined by an auctioning mechanism. The current structural adjustment period (since 1991) began with a fixed exchange rate which was adjusted weekly on the basis of the Kwacha's purchasing power parity. Since there was also a retention market exchange rate (in which the exchange rates were determined by market forces) co-existing with the official rate, there was in effect a dual exchange rate regime.

The exchange rate regime changed drastically in October 1992 when the bureaux de change became operational (Mutukwa *et al.*, 1994). After 3 months of their establishment, the government decided to merge the official exchange rate, which all along had been controlled, with the bureaux de change cum retention market exchange rate. The daily official rate was henceforth to be determined by the weighted average of the bureaux de change rates. The rates were merged because the government believed there should be a single market determined exchange rate. Also, the major foreign exchange earner, the Zambia Consolidated Copper Mines, which also happened to be the major consumer of imports, felt that it was being treated unfairly because its Kwacha receipts were at the cheaper official rate and yet its suppliers priced their goods at the bureaux cum retention market exchange rates which were more expensive.

The Kwacha depreciated quickly to reach around K560 per US dollar in May 1993 from K359 at the end of December 1992. From the middle of 1993 the Kwacha made a remarkable recovery

from its earlier depreciation, reaching about K350 to the US dollar by the beginning of October. This turn about was largely attributed to the tight liquidity situation that existed, with reserve money growing much slower from June to September compared to the first half of the year. Another indication of the tight liquidity has been the lower growth rate of the money supply from an average of about 8 percent per month between January and May to only 2.1 up to October. Finally, the high real interest rates have also led to less borrowing from the banks which in turn have reduced the demand for foreign exchange, thereby contributing to the kwacha's appreciation (Mwanza *et al.*, 1994).

3.4.6.3 Foreign Exchange Liberalization

Another key area of reform has been foreign exchange liberalisation to the extent of full convertibility. As alluded to earlier, Zambia had for most part of the era after 1975 faced acute foreign exchange shortages which resulted in industries operating below capacity. The abandonment of the 1985 program in which an auction system allocated foreign exchange the new Foreign Exchange Management Committee that was established rationed foreign exchange among the competing needs. The preference for allocating foreign exchange was given to manufacturing firms, especially those using local raw materials, and to farming.

This system of allocating foreign exchange proved to be inefficient. Against this, an Open General License Import System (OGL) was introduced in 1990. This system initially operated on the basis of a positive list whereby an item included on the list committed the central bank to providing foreign exchange to each importer for its procurement. The number of items on the list was continuously increased until, in 1992, it was finally decided to drop the positive list and, instead, have a negative list of only 11 items which would not qualify for importation under the OGL arrangements (White, 1994).

Although foreign exchange allocation under the OGL system worked better than it did under the foreign exchange management committee, it was far from being perfect because the exchange rate was still controlled. This, on a number of occasions, resulted in pipelines of foreign exchange approvals which could not be timely funded. Exporters of non-traditional commodities and importers who were willing to buy foreign exchange from them under the foreign retention market facility, however, were able, most of the time, to access foreign exchange quickly.

In October 1992, bureaux de change opened. Exporters of goods and services were free to sell their export proceeds at the bureaux. Importers of goods and services were also allowed to buy

their foreign exchange from the bureaux, just as they were free to do so from commercial banks. As a result, exchange control on current account transactions were virtually removed save for those on a small number of restricted items like arms and ammunition. In theory there still existed quantitative restrictions on how much foreign exchange could be bought per transaction in addition to restrictions on capital transactions. In practice however, it was impossible to police the restrictions.

The supply of foreign exchange improved substantially after the merger of the retention, bureaux de change and the official exchange rates in December 1992 especially after June when the monetary conditions tightened up. It was this mark of confidence later towards the end of 1993, apart from the confidence that the exchange rate was likely to remain stable in future that encouraged the authorities to finally eliminate exchange control in January, 1994.

3.4.6.4 Liberalisation Regarding Entry to Financial Market

Furthermore, the financial sector reforms implemented after 1991, led to the opening of several banks, many with poorly qualified staff and insufficient capital. The number of banks increased from six, before the reforms, to twenty-five in December 1994, with 188 branches (Maimbo, *et al.*, 2003). During the same period, the Central Bank of Zambia reduced the statutory reserve ratio from thirty percent to three percent. The ensuing liquidity surge, and insider lending, imprudent foreign exchange operations and high levels of non-performing loans created difficulties in several institutions. There were thirteen bank failures in the late 1990s, costing the government in excess of K90 billion. Several failures remain unresolved. In response, the Central Bank of Zambia tightened up the regulations on capital requirements and foreign exchange trading, and increased the statutory reserve ratio to eleven percent in 2000, and 17.5 percent in 2002. This ratio was cut to fourteen percent in October 2003, in order to foster the reduction of the lending rates. This move was consistent with the Bank of Zambia policy of increasing its reliance on indirect (market-based) monetary policy instruments, rather than direct regulation of the financial sector (FSDP, 2004).

3.4.6.5 Institutional Reforms

Major reforms to the system of prudential regulation and supervision of the financial system began in 1994. As in many other African countries the prudential framework put in place during the colonial period and the early years of independence was not adequate to effectively regulate the banking system, especially as the latter evolved during the 1980s. There were serious deficiencies in both the banking legislation and the supervisory capacities in the BOZ. The fall of

a number of banks in later 1990s also put a test on this prudential regulation and exposed their weakness.

What is clear though is that prior to the economic reforms of the 1990s, the BOZ's main role was in ensuring compliance with government imposed regulations. Prudential regulation was not a priority, and bank inspections concentrated on checking that banks complied with foreign exchange and interest rate controls as well as statutory liquidity requirements (Bank of Zambia, 1994). The BOZ also acquired an equity stake in ZNCB, which clearly would have compromised its role as the bank regulator had the latter been taken more seriously. To some extent the lack of emphasis accorded to prudential regulation was justifiable until Bank of Credit and Commerce of Zambia and Meridien Bank were set up in the early 1980s, the banks operating in Zambia were either owned by well established foreign banks or the government and thus reasonably secure in terms of the safety of deposits. It was also the case that the controlled economy provided a relatively safe environment for bank lending.

However with the advent of BCCZ and the local banks, a much more purposeful approach to prudential regulation and supervision was required. The fact that reforms to the prudential system were delayed until 1994 has almost certainly cost the taxpayers heavily as a result of the Meridien collapse and may have resulted in further costs if many more of the local banks had failed. The potential fragility among the local banks is at least partly attributable to the fact that the revisions to the banking legislation were not enacted until three years after a more liberal attitude to bank licensing was adopted. Substantial new entry into the banking industry was allowed before adequate prudential legislation and supervisory capacities had been put in place. Between 1965 and 1994 the legislative framework governing the banking industry was contained in the Banking Act and Bank of Zambia Act (Chapters 700 and 699 of the Laws of Zambia). Various aspects of these Acts impeded effective prudential regulation.

First, the authority to license banks, and to withdraw licenses, lay not with the BOZ but with the Registrar of Banks appointed by the Ministry of Finance (MOF). Second, the Banking Act did not provide the BOZ with the authority to issue or update regulations pertaining to prudential requirements. One consequence of this was that the minimum capital requirement to set up a bank, which had been set in the Banking Act at Kw2 million (worth \$3 million in 1971), remained unchanged until 1989 by which time it was worth \$150,000. It was then raised to Kw20 million and remained at that level until the banking legislation was finally revised in 1994, by which time it had been eroded by inflation to such an extent that it was equivalent to only

\$30,000. Third, the Banking Act was unclear as to what was required of directors and managers of banks applying for licenses in terms of qualifications, experience, etc., and on what grounds applications could be rejected. The deficiencies in the licensing regulations allowed banks lacking strong capital and managerial resources to be set in the late 1980s and early 1990s.

The Banking Act did set out capital adequacy standards relating capital and reserves to liabilities minus liquid assets, and specified that minimum transfers should be made from profits into a reserve fund. But the capital adequacy provisions were largely meaningless in the absence of appropriate regulations regarding provisioning for doubtful debts and non-accrual of unpaid interest. Hence a bank which was technically insolvent could appear well capitalised. Important omissions in the Banking Act were the lack of any references to insider lending and loan concentration. Moreover building societies, Post Office Savings Bank and other financial institutions established by a written law of Zambia were explicitly excluded from the Banking Act.

The banking legislation was revised with the enactment of the Banking and Financial Services Act (BFSA) in 1994. The BFSA gave the BOZ more legal independence from the ministry of finance (MOF). In this regard the Registrar was placed under BOZ control although the MOF must be consulted on licensing and other matters. It is more flexible than the previous Banking Act with the BOZ (or the MOF on the recommendation of the BOZ) having the authority to issue prudential guidelines and regulations (e.g. in regard to capital adequacy) and to demand regular data from financial institutions relating to prudential matters. The BFSA is also far more comprehensive in terms of both the type of financial institutions covered and the requirements demanded of these financial institutions and their directors.

The BFSA covers all financial institutions in Zambia. In granting licenses to financial institutions the Registrar must take account of the financial resources, experience and character of applicants and proposed directors. The minimum paid up capital for a bank has been raised to Kw1.25 billion (\$1.3 million). The BFSA imposes restrictions on loan exposure and insider lending, although the latter is less restrictive than in other banking legislations on the continent. It also imposes restrictions on shareholder concentration and, by stipulating that a majority of board members should not be officers or employees of the bank, provides for some degree of formal separation of the roles of ownership and management.

The BFSA gives the BOZ authority to take a range of measures, from issuing directives stipulating remedial action to revoking a bank's license, against banks that conduct unsafe or unsound practises or infringe provisions of the BFSA. In serious cases (e.g. when a bank refuses or is unable to comply with orders from the BOZ) the BOZ can appoint a curator to oversee the restoration of sound practises in the bank. In this regard the curator can recommend that the bank be wound up if it was found that it cannot be restored to a safe operating condition. Where the BOZ believes a bank to be insolvent it has the power to take possession of the bank and appoint a receiver.

Alongside the legislative revisions, measures have been initiated to strengthen supervisory capacities at the BOZ. A four year capacity building programme was started in 1994 to recruit and train bank examiners, a priority given that the supervision department is currently seriously understaffed.

3.4.7 Negative Effects of Financial Reforms

Following the reforms in the financial sector system, it is clear that the Zambian financial sector has not achieved its intended goals, and that it plays only a limited role in the economy (Table 21). Symptoms of these limitations are the lack of financial intermediation, low market liquidity, high interest rates, high bank costs, absence of long-term lending, underdevelopment of the secondary markets and low public confidence. There is also limited access to financial services in the rural areas, and for the low and middle income earners (Martinez, 2006). The ratio of M2 to GDP in Zambia has been around fourteen to twenty eight percent, which is in the middle range for the sub-Saharan African region (in the early 1980s, M2 reached 35 percent of GDP).

However, private sector credit was only six percent of GDP in 2001, one of the lowest ratios in the region. In contrast, public sector credit, at fourteen percent of GDP, was relatively high by sub-Saharan African standards. Moreover, Zambian banks hold more foreign assets than banks elsewhere in Africa. Bank earnings depend heavily on fees, the margin between the loans and savings rates, loans to blue chip companies and foreign exchange and government securities trading.

The deposit to GDP ratio has been low and stagnant averaging around 12 percent of GDP throughout 1990s and part of 2000s. This is a clear sign of financial stagnation taking place in Zambia. This argument is supported by the studies of Martinez (2006) and Chiumya (2004)

which indicates that only a small population in Zambia is banked. Even the credit allocation to the private sector is very expensive and scarce.

Table 21: Selected Monetary Ratios in Zambia (1990-2004)

Year	Private Credit/GDP	M2/GDP	Velocity GDP/M2	bank Deposit/GDP	Fiscal Deficit
1990	8.9	26	3.9	15.5	-8.3
1991	7.3	28	3.6	12.6	-7.2
1992	-	19	5.4	10.8	-2.5
1993	4.8	14	7.5	9.3	-5.6
1994	6.3	16	7.1	10.1	-6.8
1995	8.4	18	6.4	11.5	-3.8
1996	9.5	18	6.0	13.0	-5.4
1997	8.0	17	6.3	12.8	-4.1
1998	7.0	18	6.5	13.8	-8.0
1999	7.4	20	6.2	14.2	-4.0
2000	8.6	25	5.7	16.3	-7.0
2001	7.3	15	5.5	17.1	-8.0
2002	6.3	21	5.2	16.8	-6.3
2003	6.8	20	5.5	16.6	-6.6
2004	8.1	21	5.3	16.7	-3.3

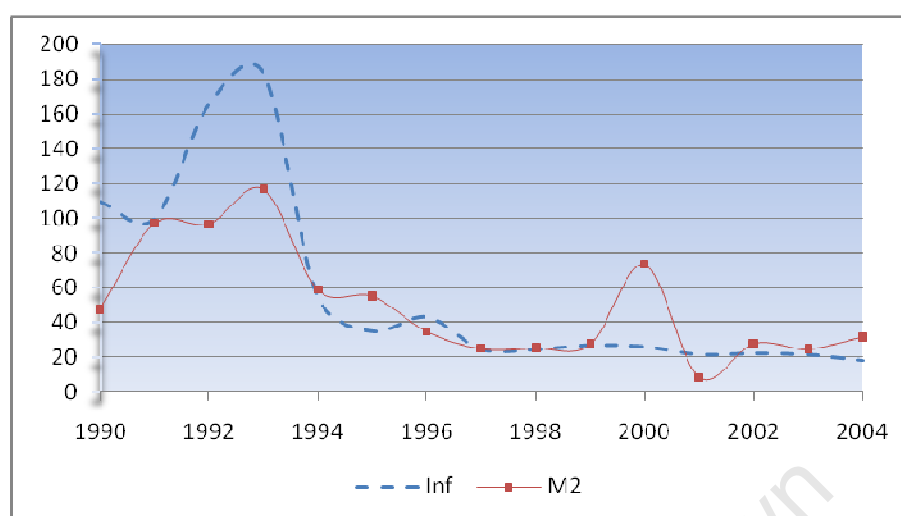
Source: World Development Indicators

The FSDP attributes the imbalances to high inflation, crowding out of the private sector by the government, the lasting impact of the failure of several institutions and the regulatory shortcomings of the Bank of Zambia, the Securities and Exchange Commission, the Pensions and Insurance Authority, the Zambia Competition Commission and the Patents and Companies Registration Office. Zambian financial institutions are exposed to high risks due to the economy's dependence on copper, the accumulation of public sector arrears and the potential volatility of the interest rates and exchange rates (FSDP, 2004).

3.4.8 Positive Effects of Financial Reforms

As indicated earlier, the primary object of financial sector reforms was principally to improve on financial service delivery and facilitate the development of monetary policy. There are indications, however as we have discussed above, that the outcomes have been, for some aspects of the reform package, far less successful than anticipated. Here we discuss the extent to which reform objectives were achieved in terms of sectoral performance. The situation can be summed up as follows:

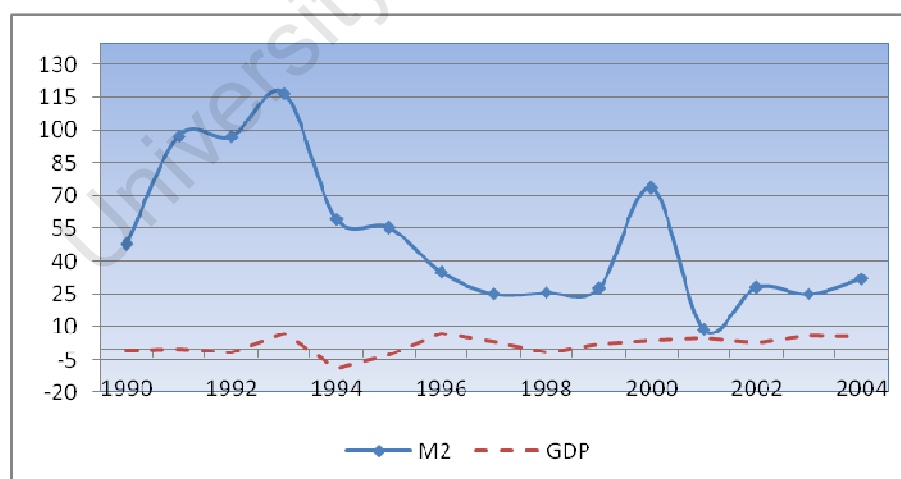
Figure 26: Trends of Money Supply & Inflation (1990-2004)



Source: Bank of Zambia Annual Reports

At the beginning of the last decade, a predominant concern was to bring down inflation by controlling growth of the money supply and soaking up liquidity. Consistent with the liberalisation approach, this was to be accomplished increasingly through interest rates and open market operations. Lending rates became positive in real terms, currency in circulation declined relative to GDP, and inflation fell to 17% by the end of 2004 (**Figure 26** and Figure 27).

Figure 27: Trend in Inflation and Real GDP growth Rate (1990-2004)



Source: Bank of Zambia Annual Reports

An impressive growth in real GDP has also been achieved, where negative trends in real GDP growth rate were reversed. The economy improved from -8.6% in annual growth rates recorded in 1994 to relatively steady positive growth rate of around 5 percent during the reform period of

2000s. However, to ascribe this impressive performance in real GDP growth rate only to financial sector reform would be dubious. In 1993, three years after the reforms were started, real GDP grew by 6.80 percent where as it dropped to -8.6, -2.85, and -1.86 percent in 1994, 1995 and 1998 respectively (the first years of reforms).

The channels through which the reform would have led to improved growth have been shown to deteriorate during the first years of the reform. Financial savings, efficiency, credit flow to the private sector became poorer during the reform period. Thus, forces outside the financial sectors system can be partly contributed to the growth in real GDP (e.g., agriculture, wholesale and trade and manufacturing industry).

3.4.9 Summary

The Zambian economy was subject to extensive government intervention during the 1970s and 1980s which made a major contribution to the long term decline of the economy. Interventionist policies were extended to the financial sector, with government owned banks set up, foreign non bank financial institutions nationalised and interest rates controlled. Despite this, the banking system survived reasonably well, at least until the second half of the 1980s. Zambia did not experience severe financial shallowing as occurred, for instance, in Uganda and Ghana; nor did the main government owned bank (ZNCB) accumulate huge losses as did its counterparts in many other African countries. Moreover the foreign banks retained a significant share of banking markets and continued to provide retail and corporate banking services.

The damage done by interventionist policies to the banking system was limited for two reasons. First, inflation was moderate until the mid 1980s, so that even though real interest rates were negative, holdings of monetary assets did not suffer rapid erosion in their real value. Second, the main policy channel through which resources were allocated in the economy was not the banking system but the system of foreign exchange controls. This provided some form of protection for the banks against having to extend credit to un-creditworthy borrowers to meet developmental or political objectives, in part because it obviated the need for the government to impose detailed sectoral credit guidelines on the banks. In addition, given the scarcity of foreign exchange, access to foreign exchange provided borrowers with a degree of monopoly power which would have boosted their creditworthiness.

The resilience of the banking system to the mismanagement of the economy began to be eroded from the late 1980s onwards. Accelerating inflation induced a decline in financial depth as real

interest rates became highly negative. Devaluation and the reduction in trade protection intensified the financial difficulties of the parastatal sector, with adverse consequences for the quality of ZANACO's loan portfolio, which was dominated by loans to parastatals. The growth of local private sector banks, many of which were undercapitalised, added to the fragility in the banking system, especially because prudential legislation and supervisory capacities were deficient.

Political constraints obstructed the adoption of a comprehensive and consistent structural adjustment programme in Zambia, and as a result financial reforms were delayed until the early to mid 1990s. Financial markets were liberalised in 1992/93 and new banking legislation was enacted in 1994 to accompany measures to strengthen supervisory capacities. The enactment of the Banking and Financial Services Act has considerably strengthened the legislative framework for prudential supervision although the personnel resources of the bank regulators are currently very weak. Financial sector reforms are undeniably necessary to improve both the efficiency and the prudential soundness of the banking system.

Chapter 4

Analytical Framework

4.1 Introduction

This chapter starts with the brief motivation of the analytical framework linking finance and growth. This is followed by the introduction of the data used in the study and then proceeds to review our adopted research methods. The methods adopted in this thesis draws heavily on recent developments in time-series econometrics. Thus, the analysis is applied in the context of a vector error correction (VECM) and Toda-Yamamoto framework. The chapter also includes a discussion of how the orders of the VAR are determined, plus an explanation of how the intercepts and trends are specified in the models.

The chapter also covers the various statistical structures used to analyse a mixture of representations of the various processes. The various representations are useful for different purposes such as, identifying the Granger-causal chain and its strength. In addition to indicating the time profile of shocks to either the individual variables or the whole system the causal inference between financial development and economic growth is analysed using the systems of equations. The model framework used in this thesis uses the long-run structural modelling approach, the implementation of which is the major technical innovation in this study. The chosen approach permits the estimation and testing of more than one co-integrating relationship subject to identifying and over identifying restrictions on the long-run (or co-integrating) relations. To test for the robustness of the results from VECM we employ a complementary framework based on Toda-Yamamoto methodology framework.

From this brief outline the rest of this chapter is organised as follows: Section 4.2 presents the theoretical framework linking finance and growth. Section 4.3 discusses the augments for applying unit root test in time series data. Section 4.4 discusses the econometric modelling applied in this thesis.

4.2 Analytical Framework

4.2.1 Background

This section motivates the empirical analysis by reviewing the theoretical foundations underlying the principle that capital inflows lead to higher economic growth, as well as the view that the level of domestic financial development is a factor in the link between capital inflows and economic growth. The relationship between capital inflows and growth is first examined in the context of a simple endogenous-growth model. This framework highlights the various channels to growth emphasised in this thesis: that capital flows can promote growth by increasing the domestic investment rate, by leading to investments that are associated with positive spillovers, and by increasing domestic financial intermediation. It also shows how the existing level of development of the financial system plays a role in determining the extent to which capital flow influence growth.

4.2.2 Analytical Framework

The intuitive reasoning for the existence of financial sector development influence on economic growth is quite complex though in a nutshell one would say financial sector system is an institution that uses real assets to cause real economy. This thesis therefore uses the endogenous growth theories to describe the relationship between financial sector development and economic growth. McKinnon (1973) and Shaw (1973) developed the first generation of these theories from the framework of the neoclassical growth theory (Winkler, 1998). Neo-classical growth theory has several disadvantages in this context. The most crucial one is the fact that according to the neo-classical growth theory a change in saving or investment has an effect only in long-run which implies that the level of real per capita income is affected but not the rate of growth. Hence, financial sector development affects income per capita only in equilibrium but on the path of development the growth rate is unaffected.

This approach is counter-intuitive and incompatible with empirical facts. Numerous researchers such as (Barro, 1991; Levine & Renelt, 1992; Asilis, 1992; Barro & Sala-i-Martin, 1995; Fielding & Miezén, 1997) conclude that there is strong positive correlation between real per capita income and the rate of investment and saving. The new growth theory describes technological development endogenously as a byproduct of physical or human capital accumulation (Fry, 1995).

Today the endogenous growth theory is reigning and the existence of the relationship between financial sector development and economic growth is set beyond the doubts of many economists. The matters of direction, robustness and, of course, causation still provokes interest. In this case building of our theoretical groundwork is based on the determination of the transmission mechanism between financial sector and real economy. To do so, we defined the main functions of the financial sector. In this regard the general aim of financial sector is intertemporal, interpersonal transfer of resources (Winkler, 1998; Grandmont, 1985). More specifically, financial sector helps firms to overcome the problems of moral hazard and adverse selection and this reduces the costs of external financing (Rajan & Zingales, 1998) and transaction costs in general (Levine, 1997).

The positive effect of financial sector development on economic growth is modelled with information gathering, resource allocation and rising liquidity (Greenwood & Jovanovich, 1990), rising productivity (King & Levine, 1993a), reducing of monitoring costs (Diamond, 1984; Boot & Thakor 1997; Holmström & Tirole, 1997, Blackburn & Hung, 1998). In Greenwood and Jovanovich model financial intermediaries help agents to choose projects with higher returns. Without financial intermediaries agents could not invest in these projects because of the lack of the information and low liquidity of the project (Greenwood & Jovanovich, 1990).

This liquidity rising mechanism involve dual effect on savings. It is assumed that higher liquidity brings along higher investment returns and lowers uncertainty (Levine, 1997). Higher returns cause income and substitution effect, which means that agents can invest less to earn the same income because of the higher returns, but the opposite effect, is that consumption will be substituted with savings because of the higher productivity of the capital. Reduction of the uncertainty has also dual influence on the savings. Lower variance of the earnings causes a drop of the risk premium in the agents required rate of return, which enables more projects to be accepted. This results in rise of investment demand, rise in interest rate and increased savings. At the same time agents considering lower risks may reduce precautionary savings and this can result in drop in overall savings. As shown here it is not certain whether savings rate will fall or rise as a result of the increase in liquidity. This argumentation undermines the credibility of the liquidity rising models.

Furthermore, it has been argued that higher liquidity in the stock market may not encourage investment into higher return projects. Higher liquidity makes the sale of stocks easier and consequently stockowners do not have to engage in costly monitoring of the management.

Problems with corporate governance endanger effective allocation of resources and reduce productivity (Levine & Zervos, 1998).

The work by Jappelli and Pagano (1994) has laid the ground work for the theory that describes negative relationship between financial sector development and economic growth. The reasoning underlying this relation comes straightforward from the endogenous growth model. If agents cannot borrow the desired amount, aggregate saving will be higher than in the presence of the perfect capital markets. In more detail Jappelli and Pagano look at the credit rationing towards households. Being liquidity-constrained households cannot borrow effectively against their future earnings and so they save more. Increased savings means growing investments, which in the framework of endogenous growth leads to higher growth rate.

On the other hand proponents of financial development argue that liquidity constrained households have less incentives to accumulate human capital. Agents simply choose working instead of learning (De Gregorio & Guidotti, 1993; De Gregorio, 1993). This causes the lower economic growth in the framework endogenous growth (Barham, *et al.*, 1995; Cartiglia, 1997).

4.2.3 How can Financial Development affect Growth?

Pagano (1993) presents a simple endogenous growth model to explain how financial development may affect growth. A similar model is referred by Thiel (2001), in his review on finance and economic growth.

The link between finance and economic growth is very complex and may run through various transmission channels. Financial development might: reduce the loss of resources required to allocate capital (funnelling saving to firms); increase the savings ratio (affect the saving rate); improving the allocation of capital (raise capital productivity). In this thesis the relationship between finance and growth is captured using the model equation (1).

Thus equation (1) is what forms the basis our econometric modelling and in the general form it is specified as:

$$rgdpc = a_0 + a_1gfcf + a_2pvy + a_3wedge + a_4uc + a_5int + a_6openk \quad (1)$$

where: **gfcf** is the ratio of investment to g.d.p. (i.e., capital formation), **pvy** is credit by the commercial banks to the private sector, **wedge** is the measure of the bank sector efficient. The

control variables include: **int** which represents real interest rates, **openk** openness of the country and **uc** for uncertainty.

4.3 Unit Root Tests & Order of Integration

A brief outline why testing the time series data is important before applying the test of interest is outlined in this section. As it has been argued in literature the conventional definition of co-integration is given by Engle and Granger (1987): “The components of the vector x_t are said to be co-integrated of order d, b denoted $x_t \sim ci(db), b > 0, d > 0$, if (1) all components of x_t are $i(d)$; (2) there exists a vector $\alpha (\neq 0)$ so that $z_t = \alpha \cdot x_t \sim i(d - b), b > 0$. The vector α is called the co-integrating vector.” A more flexible concept is suggested by Campbell and Perron (1991) who do not exclude stationary variables from the vector x_t . However, such an allowance only makes sense if x_t contains at least two integrated variables which can co-integrate (i.e., form a linear combination at a lower degree of integration. When applying economic equilibrium models empirically, stationary linear combinations are of special interest because they tell us to which level an otherwise random-walk like variable should converge given certain levels of the other variables in the co-integration space. As many economic time series are often found to be integrated of order one (Nelson and Plosser, 1982), others to be stationary (e.g. interest rate spreads) and still others even tend to be integrated of order two in some countries, (Juselius, 1993).

In view of the above observation, checking for the order of integration of a time series is a natural start to co-integration analysis because it allows us to know whether the variables are integrated in levels (in case of $I(1)$ variables) or the first differences of a variable (when it is $I(2)$) should be used to compose the long-run relationships.

The objective of this section consist a review of an appropriate test that the entity or at least a sufficient number of the time series to be included in our model are integrated of order 1 and can therefore be used in a vector error correction framework involving their levels and first differences. The order of integration is tested for by one method the augmented Dickey-Fuller unit root test. This test procedure asserts the variable is $I(1)$ in the null hypothesis.

4.3.1 The Augmented Dickey-Fuller Test

Idea and specification issues: In the simplest version of the Dickey-Fuller test (DF test) a unit root in time series y_t is searched for by estimating

$$y_t = \mu_a + \rho_a y_{t-1} + u_t \quad (2)$$

$$\Delta y_t = \mu_a + \rho_a y_{t-1} + u_t \quad (3)$$

where $y_a = \rho_{a-1}$ and $\mu_t \sim iid(0, \sigma^2)$, and by then testing the Hypothesis $H_0: y_a = 0$ against the alternative $H_1: y_a < 1$. Under the null, the t -values of y_a do not follow a standard t -distribution but a Dickey-Fuller distribution (Dickey and Fuller, 1981). Actually, applying standard critical t -values would result in over-rejection of the null. The reason for this deviation from the standard t -distribution is that the tests based on the DF-distribution are similar, e.g., the test equation for y_t contains more deterministic elements than the data-generating process (d.g.p.) for y_t in order to ensure that the null and the alternative hypotheses be nested by the test (Harris, 1995). Thus equation 3 above can serve as a valid test equation only if the initial value y_0 of the d.g.p. and μ_a equal zero.

In this case a deterministic trend has to be incorporated into equation 3 if the economic time series at hand contain a deterministic trend in levels. The question whether this is the case or not can be addressed by sequential testing, with the help of economic theory or by visual inspection. These two methods are briefly sketched in the following paragraphs.

Perron (1988) suggests a test sequence which aims at determining both the order of integration and the most probable deterministic structure of a time series. Starting with a DF test equation including trend and intercept,

$$\Delta y_t = \mu_b + \delta_b t + \rho_b y_{t-1} + u_t \quad (4)$$

first the null of a unit root (against the alternative of trend stationarity) and then the joint hypothesis of a unit root and no trend are tested. If the latter is rejected whereas the former is not, the deterministic trend is accepted as an element in the d.g.p. of y_t . The d.g.p. and the DF test equation thus have the same design ('exact test' as it is called by Harris (1995)). As a consequence, the critical values of the standard normal distribution can now be taken to evaluate \hat{y}_b because the deterministic trend asymptotically dominates the stochastic trend (West, 1988). The null of non-stationarity might now be rejected more easily. However, if the joint F -test on the deterministic and the unit root is not rejected, it is concluded that there is no deterministic trend in y_t , so δ_b can be dropped from the model.

The analogous testing sequence is then applied to the model described in equation 8 (unit root against the alternative of mean stationarity) with the joint hypothesis being formulated with respect to the intercept instead of the trend. It might turn out in the F -test that even the intercept is zero, then, Fuller's (1976) critical values $\hat{\tau}$ for a test equation without deterministic elements (unit root against the alternative of stationarity around zero) should be used. The motivation for dropping unnecessary nuisance parameters is that the critical values of the DF distribution become smaller with each additional deterministic element so that overloading the model with unjustifiable deterministic parameters leads to under-rejection of the null. The procedure stops whenever the null of a unit root is rejected.

There are several objections against the use of the sequential testing procedure just described. First, a general size problem can result from sequential testing by the potential accumulation of wrong test decisions, e.g., when the F -tests rejects although the nulls are true. Second, the use of standard normal distribution is misplaced as soon as the deterministic of the d.g.p. do not match the one of the test equation. To rely on the result of the F -test involves a risk: If the true d.g.p. does not contain a deterministic trend, its presence in the test equation introduces a downside bias in the estimate of y_b thereby making a rejection of the null of non-stationarity more probable (Harris, 1995). In this case it is not clear whether the rejection of the null in the F -test really stems from the presence of a deterministic trend or whether the process is in fact stationary. Clearly, the F -test cannot solve the DF test's problem of low power against a trend-stationary alternative. Third, if the true value of ρ_b is close to but smaller than one, convergence to the asymptotic test distribution is slow. Thus, in small samples the DF distribution may be a better approximation (Banerjee *et al.*, 1993).

To sum up, sequential testing is not appropriate to solve the huge uncertainty surrounding the true nature of the d.g.p. in economic time series. This is why a pragmatic mixture of economic judgement and visual inspection is adopted in our analysis.

4.3.2 Motivation for the Choice of the Test Method

Testing for causality in the context of stable VAR models involves testing whether some parameters of the model are jointly zero. The 'older' approaches utilised techniques such as the standard Granger (1969) or the Sims (1972) method which uses the non-stationary data. It is shown, however, that the use of non-stationary data in causality tests can yield spurious causality results (Park and Phillips, 1989; Stock and Watson, 1989). Hence most causality studies since the late 1980s employ unit root tests to examine the stationarity properties of variables, perform

co-integration analysis, mostly following the Johansen (1988; 1991) procedure, and formulate a Vector Error Correction (VEC) model in order to capture both long-run and short-run sources of causality between the variables. An alternative method is that of Hsiao (1981), which presupposes the use of unit root and co-integration tests but applying the standard Granger test rather than a VEC model, in cases when no co-integration is found; Yoo (2006) has applied this method among others.

As unit root and co-integration tests are known to have low power and size properties in small samples (Cheung and Lai, 1993; Harris and Sollis, 2003), there has been an increasing drift towards the use of methods which do not require that the variables be pre-tested for stationarity and co-integration. Such methods are the autoregressive distributed lag (ARDL) approach due to Pesaran and Shin (1999) and the Dolado-Lütkepohl and Toda-Yamamoto methods, which involve a modified Wald test in an augmented vector autoregressive model (Dolado & Lütkepohl, 1996; Toda & Yamamoto, 1995). Hypothesis tests can be carried out with these methods irrespective of whether the variables involved are stationary or not and regardless of the existence of a co-integrating relationship among them. Altinay and Karagol (2005) and Lee (2006) are among those who have applied one or more of these methods.

In principle, the selection of causality test method should not affect the results as long as the time series properties of variables are accounted for appropriately. However, it has been found that asymptotically equivalent methods do not necessarily demonstrate similar properties in small samples of between 25 and 35 observations, which is the actual sample size in most causality studies. In this respect, Pesaran and Shin (1999) have shown that the ARDL model is more rigorous in small samples than co-integration methods; and Zapata and Rambaldi (1997) have demonstrated that the modified Wald tests employed by the Toda-Yamamoto and Dolado-Lütkepohl methods have lower power than the Johansen-based VEC approach in multivariate models with sample size of 50 or less. Therefore, we need to keep in mind these observations or findings when comparing and interpreting the outcome of our causality test results in chapter five which are based on VECM and Toda-Yamamoto methods.

4.4 Econometric Modelling

4.4.1 Co-Integrating Analysis

The analysis applies VAR (Vector Autoregressive) time-series analysis techniques to the datasets of Kenya's, South Africa's and Zambia's financial and growth relationship. Co-integration analysis is applied within the context of the VAR because it has been demonstrated that it can

provide an important framework within which links between economic theory and econometric applications can be explored. In particular it serves to capture the economic notion of long-run equilibrium economic relationships.

Co-integration techniques are also powerful when modelling the behaviour of data series that display stochastic trends. This is because the existence of a co-integrating relationship between two or more non stationary variables counters the ordinary least squares (OLS) problem of spurious regressions and regression estimates have been shown to be super-consistent in this context. Engle and Granger (1987) demonstrated that if two variables are shown to be co-integrated, then the possibility of no causation in the Granger sense (not structural sense) is ruled out; and causality must exist at least in one direction, either unidirectional or bi-directionally.

From the theory of finance and growth we expect at least three long-run relationships to be present. The first one relates to growth. The second type of the relationship relates to the investment function and last but not least the third co-integrating vector relates to financial development proxy. The argument for these three relationships is based on the probability that while financial development indirectly affects real per capita income, feedback effects are also present from real per capita income and gross fixed capital formation to financial development. Following on this, a detailed discussion of the statistical model applied to this approach is discussed in the following sections.

The co-integration analysis applied in this study is based on the technique pioneered by Engle and Granger (1987) and extended by Johansen (1988, 1991) and Johansen and Juselius (1990, 1992) and many others. It is a full-information Maximum Likelihood Estimation method and it allows the estimation of both long and short-run relationships without having to difference the data. In testing for the presence of these relationships amongst the variables included in the data set, the Johansen and Juselius procedure is employed. Although the Johansen technique is well known a brief outline of the method is given here to shed some light on how the procedure is applied in this study.

The Johansen and Juselius (JJ) tests of co-integration are conducted through say, a p^{th} order n -dimensional vector of $I(d)$ time series variables x_t with an autoregressive representation, which in its error correction form can be mathematically expressed in the following form:

$$\Delta x_t = \delta + \sum_{i=1}^{\rho+1} \Gamma_i \Delta x_{t-i} + \Pi x_{t-\rho} + \Psi D_t + \varepsilon_t \quad (5)$$

where x_t

is an $n \times 1$ vector of $I(1)$ or stochastic variables integrated to the same order. Γ, Ψ and Π represent $n \times n$ coefficient matrices of short and long-run adjustments to the changes of the process, respectively. Δ is the difference operator, and ρ denotes the longest lag length so the VAR is the ρ^{th} order, δ is a constant or drift, and $\varepsilon_t \sim Niid(0, \Sigma)$, is a vector of white noise errors. D_t is a vector of non-stochastic variables designed to capture the time trend t and any other dummy variables should they be needed. In our co-integration tests the lag length ρ in the above model has been chosen on the basis of the Akaike Information Criterion (AIC) and Schwarz Information criterion (SC). Model (9) will be used as a benchmark model within which all the subsequent hypotheses are tested, since in the unrestricted form it corresponds to an $I(1)$ model. All higher models used in this research are nested in this model.

Important in the context of this study is the variable Π which captures information about the long-run relationships between the variables of interest. As such it is the rank (r) of (Π) which, indicates the number of co-integrating vectors. Johansen (1991) shows that if $z_t \sim I(1)$, the following restrictions on equation 9 has to be satisfied. If, (Π) has a zero rank, then no stationary linear combination can be identified and the variables in (x) are non co-integrated, meaning that they can wander arbitrarily far from each other.

There are a few things to note at this juncture. First, lack of co-integration implies no long-run equilibrium among the variables. Second, it is important to note that the term equilibrium means different when applied by economic theorists as opposed to econometricians. To economic theorists the term equilibrium refers to equality between desired and actual transactions. Whereas, the econometric use of the term makes reference to any long-run relationship among stationary variables. This means that co-integration does not require that the long-run relationship (i.e. equilibrium), be generated by market forces. However, if π has the reduced rank r , where $0 \leq r \leq n - 1$, then π can be decomposed into two $n \times r$ matrices α and β such that $\pi = \alpha\beta'$. The matrix β' consists of reduced rank r linearly independent stationary combinations or co-integrating vectors (long-run relations), whilst α can be interpreted as a matrix of vector error correction parameters or short-run adjustments (also known as feedback coefficients) to the

co-integrating relationships β_s . In such a case some of the elements of α must be non-zero, that is, there must be Granger causality involving the levels of the variables in the system to keep the elements of x_t from diverging boundlessly. Thus, not only can the existence of an equilibrium relationship be determined; but also the relative speed of adjustment of each co-integrating vector to disequilibrium shocks can be estimated. The elements of β are estimated using the, full information maximum likelihood approach.

The attractiveness of the Johansen and Juselius multivariate co-integration technique is that it makes use of the information incorporated in the dynamic structure of the model, whilst at the same time it estimates the entire space of the long-run relationships amongst a set of variables, without imposing any normalisation on the dependent variable a priori. In this case the joint analysis of the finance and growth causality issues using the Johansen and Juselius multivariate co-integration analysis allows for possible interactions between the financial development and economic growth variables. It must be stressed however, that a co-integrating vector is not unique, when more than one long-run relationship is found to exist in the system of equations.

4.4.2 Long-Run Structural Modelling

In a multivariate context, such as the one given by the finance and growth models, a vector error correction model subject to deficient rank restrictions on the long-run multiplier matrix, Π , may contain multiple co-integrating vectors termed co-integration rank. In such a case, the individual co-integrating vectors are under-identified in the absence of sufficient linear restrictions on each of the vectors and as such lack any meaningful economic interpretation. It is because of this potential difficulty that the use of VAR analysis has been criticised as being devoid of any economic content.

In order to circumvent this potential indeterminacy one needs to impose appropriate a priori just identifying restrictions and over identifying restrictions, preferably obtained from the long-run equilibrium implications of suitable underlying economic theory. Restrictions can either be coefficient restrictions, or symmetry restrictions, or both. For example, one can impose homogeneity and zero restrictions in order to identify the structural model from an estimated VAR. Long-run structural modelling endeavours to achieve this end by estimating theoretically meaningful long-run relationships through testing both just identifying and over-identified restrictions on the co-integrating vectors based on the relevant theories (in this case the financial growth theories). In other words, Long-run Structural Modelling provides a practical approach to

discriminate between the vectors by incorporating long-run structural relationships suggested by theory in an otherwise unrestricted VAR model (Garrett *et al*, 1999).

In a simple case where $r = 1$, typically the one restriction needed to identify the co-integrating relation can be viewed as a normalising restriction, which could be applied to the coefficient of any of the integrated variables which enter the co-integrating relation (by fixing its coefficient to unity) without changing the likelihood function. However in the more general case where $r > 1$, the number of such ‘normalising’ restrictions must be at least equal to r linear independent restrictions on each of the co-integrating vectors, which needs to be supplemented with further $r^2 - 1$ a priori restrictions. The log-likelihood ratio statistic to test over-identifying restrictions is asymptotically distributed as a chi-squared (χ^2) variate with degrees of freedom equal to the number of over-identifying restrictions (v) namely $n - r^2 > 0$. A large value of (χ^2) on (v) indicates that over-identifying restrictions are not consistent with data. Estimation of the model subject to all the (exact and over-identifying) restrictions, thus enables a test of the validity of the over-identifying restrictions and hence of the economic theory, to be carried out. The long-run structural modelling approach described in Pesaran and Shin (1997) and Pesaran, Shin and Smith (1996), is applied in this study so as to just test the variables to be restricted in each co-integrating space.

4.4.3 Pesaran, Shin, Smith ARDL Technique

To find out whether a unique long-run relationship between finance and growth and also for ease of reference on the variables to be normalised this thesis also employs the autoregressive distributed lag (ARDL) co-integration procedure introduced by Pesaran *et al.* (1996). To begin with, we test for the null of no co-integration against the existence of a long-run relationship. Unlike other co-integration techniques (e.g. Johansen’s procedure) which require certain pre-testing for unit roots and that the underlying variables to be integrated are of order one, the ARDL model provides an alternative test for examining a long-run relationship regardless of whether the underlying variables are $I(1)$, $I(2)$, or fractionally integrated.

As mentioned above, an important problem inherent in the system-based tests for co-integration is the precondition that it must be known with certainty that the underlying regressors in the model are $I(1)$ processors. However, given the low power of unit root tests, there will always remain a certain degree of uncertainty with respect to the order of integration of the underlying variables. For this reason, we now make use of the approach proposed by Pesaran, Shin and

Smith (1996) to test for the existence of a linear long-run relationship, when the orders of integration of the underlying regressors are not known with certainty. The test is the standard Wald or F statistic for testing the significance of the lagged levels of the variables in a first-difference regression. The involved regression is an error-correction form of an autoregressive distributed lag (ARDL) model in the variables of interest.

More specifically, in the case of an unrestricted ECM, regressions of y on a vector of x 's. The procedure first requires estimating the following model derived by Pesaran, Shin and Smith (1996.):

$$\begin{aligned} \Delta y_t = & a_{0y} \cdot t + \phi y_{t-1} + \delta_1 x_{1,t-1} + \delta_2 x_{2,t-1} + \dots + \delta_k x_{k,t-1} \\ & + \sum_{i=1}^{p-1} \psi_i \Delta y_{1,t-i} + \sum_{i=0}^{q_1-1} \varphi_{1i} \Delta x_{1,t-i} + \sum_{i=0}^{q_k-1} \varphi_{ik} \Delta x_{k,t-i} + \xi_t y \end{aligned} \quad (6)$$

with ϕ and δ as the long-run multipliers, ψ and φ as short-run dynamic coefficients, (p, q) as the order of the underlying ARDL-model (p refers to y , q refers to x), t as a deterministic time trend, k as the number of 'forcing variables', and ξ uncorrelated with the Δx_t and the lagged values of x_t and y_t .

In the second step, one has to compute the usual F-statistic for testing the joint significance of $\phi = \delta_1 = \delta_2 = \dots = \delta_k = 0$. However, the asymptotic distributions of the standard Wald or F-statistic for testing the significance of the lagged levels of the variables are non-standard under the null hypothesis that no long-run relationship exists between the levels of the included variables. Pesaran, Shin and Smith (1996) provide two sets of asymptotic critical values; one set assuming that all the regressors are $I(1)$, and another set assuming that they are all $I(0)$. These two sets of critical values provide a band covering all possible classifications of the regressors into $I(0)$, $I(1)$, or even mutually co-integrated.

A third step is required in this case in order to use the appropriate bounds testing procedure. The test proposed by Pesaran, Shin and Smith (1996) is consistent with this. For a sequence of local alternatives, it has a non-central χ^2 -distribution asymptotically. It has been argued that this is valid irrespective of whether the underlying regressors are $I(0)$, $I(1)$ or mutually co-integrated. Therefore, the recommended procedure based on the F-statistic is as follows. The F -statistic

computed in the second step is compared with the upper and lower 90, 95 or 99 percent critical value bounds (F_u and F_l). As a result, three cases emerge. First, if $F > F_u$, one has to reject $\phi = \delta_1 = \delta_2 = \dots = \delta_k = 0$ and conclude that there is a long-term relationship between y and the vector of x 's. Second, if $F < F_l$, one cannot reject either $\phi = \delta_1 = \delta_2 = \dots = \delta_k = 0$ or the hypothesis that a long-run relationship does not exist. Finally, if $F_l < F < F_u$, the inference has to be regarded as inconclusive. The order of integration of the underlying variables has to be investigated more deeply in that case.

4.4.4 Johansen VECM Technique

The motivation of employing this technique in this thesis is based on Engle and Granger (1987) who demonstrated that once a number of variables say x_t and y_t are found to be co-integrated, there always exists a corresponding error-correction representation. This means that changes in the dependent variable are a function of the level of disequilibrium in the co-integrating relationship (captured by the error-correction term) as well as changes in other explanatory variable(s).

The consequence of ECM is that either Δx_t or Δy_t or both must be caused by ε_{t-1} (the equilibrium error) which is itself a function of x_{t-1}, y_{t-1} . Intuitively, if x_t and y_t have a common trend, then the current change in x_t (say the dependent variable) is partly the result of x_t moving into alignment with the trend value of y_t (the independent variable). Through the error-correction term, the ECM opens up an additional channel for Granger-causality (ignored by standard Granger, 1969; and Sims, 1972; tests) to emerge. The Granger-causality (or endogeneity of the dependent variable) can be evidenced either through the statistical significance of the t -test of the lagged error-correction term(s) or the F-test applied to the joint significance of the sum of the lags of each explanatory variable. The non significance of both t -test(s) and F-test(s) in the VECM indicates econometric exogeneity of the dependent variable.

In addition to indicating the direction of causality amongst variables of interest, the VECM approach allows us to distinguish between short-run and long-run forms of causality. When the variables are co-integrated, then the short-term deviations from this long-run equilibrium will feed back on the changes in the dependent variable in order to force the movement back towards the long-run equilibrium. If the dependent variable (say, the finance or growth) is driven directly by this long-run equilibrium error, then it is responding to this feedback. If not, it is responding only to short-term shocks to the stochastic environment.

The *F-tests* of the differenced explanatory variables provide an indication of the short-term causal effects, where as the long-run causal relationship is implied through the significance or otherwise of the *t* test(s) of the lagged error-correction term(s). These terms contain the long term information since it is derived from the long-run co-integrating relationship(s). The coefficient of the lagged error-correction term is, however, a short-term adjustment coefficient and represents the proportion by which the long-run disequilibrium (or imbalance) in the dependent variable is being corrected in each short period. Non significance or elimination of any of the lagged error-correction terms affects the implied long-run relationship and may be a violation of the assumed theory. The non-significance of any of the differenced variables which reflect only the short-run relationship, however, does not involve such violations. This is because theory typically has little to say about short-term relationships (Thomas, 1993) and this is certainly the case in our study as demonstrated by the abundance of short-term theories and the contradictions in the empirical results.

The application of VECM is important. For instance if the variables are co-integrated, then causality tests which incorporate differenced variables will be misspecified unless the lagged error-correction term is included (Granger, 1988; Toda and Phillips, 1993). Second, standard tests which establish stationarity by mechanically differencing variables eliminate the long-run information embodied in the original level form of the variables. The VECM derived from the co-integrating equation(s) below overcomes these problems by including the lagged error-correction term which reintroduces the long-run information lost through the differencing procedure and opens up an additional channel of Granger causality.

This forms an important statistical innovation in this research given that it accounts for short-term dynamics whilst still preserving the long-run structural. If this relationship is not taken into account then previous studies may have misspecified an important variable when assessing short term lead-lag dynamics and also allows us to assess the dominant information attributes in the market place. The VECM allows long-run information incorporated in the variables to obey equilibrium constraints whilst short-run information is allowed to have a more flexible dynamic specification.

4.4.5 Application of Johansen ML approach

The Johansen procedure as pointed out in literature is a multiple equation method that permits the identification of the co-integration space using a canonical correlation method. This finally

enables one to carry out the testing of the co-integration relationships in a multivariate VAR Model.

To briefly illustrate this point let us take the following model which includes seven variables: $lnrgdpc_t = (lngfcf, lnprvy, lnwedge, lnuc, lnint, lnopenk)$, and consider the following autoregressive representation where $lnrgdpc$ is treated as a dependant variable:

$$\Delta x_t = \delta + \sum_{t-1}^{\rho+1} \Gamma_i \Delta x_{t-1} + \Pi x_{t-\rho} + \Psi D_t + \varepsilon_t \quad (7)$$

Where $x_t = lnrgdpc, lngfcf, lnprvy, lnwedge, lnuc, lnint, lnopenk$, Γ and Π representing short and long-run coefficients and δ is a constant term. We note too that Π is a $p \times p$ matrix. The rank r of matrix Π is equal to the number of co-integrating vectors. The hypothesis of co-integration in this regard is the hypothesis of the reduced rank of Π :

$$H_1(r): \alpha \beta' \quad (8)$$

where α and β are $p \times r$ matrices of the full rank. The β in this case refers to the co-integrating parameters and α measures the speed of adjustment towards the long-run equilibrium and its called a loading factor.

This method can further be illustrated by using matrices for an assumed rank of three as follows:

$$\Pi x_t = \begin{pmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} \\ \alpha_{41} & \alpha_{42} & \alpha_{43} \\ \alpha_{51} & \alpha_{52} & \alpha_{53} \\ \alpha_{61} & \alpha_{62} & \alpha_{63} \\ \alpha_{71} & \alpha_{72} & \alpha_{73} \end{pmatrix} \begin{pmatrix} \beta_{11} & \beta_{21} & \beta_{31} & \beta_{41} & \beta_{51} & \beta_{61} & \beta_{71} \\ \beta_{12} & \beta_{22} & \beta_{32} & \beta_{42} & \beta_{52} & \beta_{62} & \beta_{72} \\ \beta_{13} & \beta_{23} & \beta_{33} & \beta_{43} & \beta_{53} & \beta_{63} & \beta_{73} \end{pmatrix} \begin{pmatrix} lnrgdpc_{i-1} \\ lngfcf_{i-1} \\ lnprvy_{i-1} \\ lnwedge_{i-1} \\ lnuc_{i-1} \\ lnint_{i-1} \\ lnopenk_{i-1} \end{pmatrix} \quad (9)$$

From the theory point of view regarding co-integration analysis, it has been found that if there are more than one co-integrating vectors in the model, then we have a problem of identification. In order to just identify the long-run relationship one needs nine restrictions in the following order.

$$\begin{pmatrix} a_1 = 1; & a_2 = 0; & a_3 = 0 \\ b_1 = 0 & b_2 = 1 & b_3 = 0 \\ c_1 = 0 & c_2 = 0 & c_3 = 1 \end{pmatrix} \quad (10)$$

In addition to the just identification restrictions outlined above, one may impose further restrictions on the model in order to test for over-identifying restrictions on β and α .

In this case using the Johansen procedure entails estimating equation (7) by employing the maximum likelihood (ML) technique and testing the null hypothesis of no co-integration, that $H_0: (x = \psi\xi)$ of r co-integrating relationships, $\xi x_{t-1} = \eta_{it}$, and where r is the rank of the matrix $x(0 < r < p)$, ψ is the matrix of weights with which the variables enter co-integrating relationships, and ξ is the matrix of the co-integrating vector. As stated by Harris (1995), this procedure could lead one finding independent co-integrating vectors in the system of equation. The question then is how is this implemented?

The presumption is that the answer lies in the Johansen methodology which keeps to the following steps: (1) determine the order of the underlying VAR, (2) decide whether to include deterministic terms in the VECM, (3) estimate the VECM and determine the rank of Π , (4) impose the just identifying restrictions on β , (5) test over-identifying restrictions on β and (6) test direction of the relationships.

From this brief outline above the following features motivates the application of the co-integration and error correction modelling in the analysis data of this thesis. For instance, the methodology holds the promise of several intuitive implications. First, if the variables are co-integrated, then in the short-run, deviations from the long-run equilibrium will feed back into changes in the dependent variable(s) in order to force the movements back towards long-run equilibrium (i.e., short-run causality). Second, if the dependent variable (say the real per capita income) is driven directly by this long-run equilibrium error, then it is responding to this feedback. If not, it is responding only to short-term shocks to the stochastic environment. Third, the existence of long-run causality or the endogeneity of the dependent variable can be demonstrated through the statistical significance of the t -test of the lagged error correction term and/or the F -test applied to the joint significance of the sum of the lags of each explanatory variable. In other words, the F -tests of the differenced explanatory variables, provide us with an indication of any short-term causal effects, whereas the validity of the long-run relationship is implied through the significance of the t -test(s) of the lagged error correction term(s), which

contain the long-term information since it is derived from the long-run co-integrating relationship(s).

The coefficient of the lagged error correction term however, has the interpretation of being speed of adjustment parameters and represents the proportion by which the long-run disequilibrium in the dependent variable is being corrected in the short term. The larger the error-correction terms the greater the response of that variable to the previous period's deviation from the long-run equilibrium. At the other extreme, non-significant values of any of the lagged error correction terms imply that the variable(s) in the system of equation are unresponsive to the last period's equilibrium error. Such an extreme scenario affects the implied long-run relationship and may be a violation of the underlying theory. On the other hand, the non-significance of any of the differenced variables, which reflects only the short-term relationship, does not involve any theory violations, because theory especially economic theory, typically offers very little information on short-term relationships (Thomas, 1993).

The VECM therefore plays the simultaneous role of indicating the direction of Granger causality or the endogeneity of dependent variables as well as allowing us to distinguish between long-term and short-term dynamics of variables in the co-integrating system. Thus a known novelty of error correction techniques can be illustrated in testing various economic issues which are especially elusive with respect to the causal direction. For example, Masih and Masih (1998) have used a multivariate formulation of VECM techniques in order to test for the existence of causal chains implied by major hypothesis in theory. Below the attention is drawn to the VECM model which is applied in our analysis for causality.

4.4.6 Model Specification (VECM)

The model specification in this study is based on the model used by Craigwell and Downess (2001) in their study entitled: 'The Finance-Growth Nexus: A Multivariate VAR. Analysis of A Small Open Economy'. The model consists of only three equations out of the whole VAR model because the interest of the study is to test both the direct and indirect causal inference between financial development and economic growth. Based on this the thesis does not seek to test the causality relationship with the other variables. The other point to note is that the other variables have been included in the model as control proxies. In this preferred model the indirect relationship is what makes our VAR model to have three co-integrating vectors. Thus to test for causality equation 11 is specified using stationary variables. Consequently our preferred model uses the error-correction representation specified as follows:

$$\begin{aligned}\Delta rgdpc_t = & \alpha_0 + \sum_{t=1}^{\rho-1} a_i \Delta rgdpc_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta gfcf_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta pvy_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta uc_{t-1} \\ & + \sum_{t=1}^{\rho-1} a_i \Delta int_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta openk + \sum_{t=1}^{\rho-1} a_i \Delta wedge_{t-1} + ect_{t-i} + \varepsilon_t\end{aligned}\quad (11)$$

$$\begin{aligned}\Delta rgfcf_t = & \alpha_0 + \sum_{t=1}^{\rho-1} a_i \Delta rgdpc_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta gfcf_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta pvy_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta uc_{t-1} \\ & + \sum_{t=1}^{\rho-1} a_i \Delta int_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta openk + \sum_{t=1}^{\rho-1} a_i \Delta wedge_{t-1} + ect_{t-i} + \varepsilon_t\end{aligned}\quad (12)$$

$$\begin{aligned}\Delta pvy_t = & \alpha_0 + \sum_{t=1}^{\rho-1} a_i \Delta rgdpc_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta gfcf_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta pvy_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta uc_{t-1} \\ & + \sum_{t=1}^{\rho-1} a_i \Delta int_{t-1} + \sum_{t=1}^{\rho-1} a_i \Delta openk + \sum_{t=1}^{\rho-1} a_i \Delta wedge_{t-1} + ect_{t-i} + \varepsilon_t\end{aligned}\quad (13)$$

where: *rgdpc* is the real per capita income, *gfcf* stands for the gross fixed capital formation or investment, *pvy* and *wedge* represent the credit offered to the private sector by the commercial banking system and efficiency of financial intermediation respectively. *uc* is defined as the financial uncertainty, while *int* is real interest rates. Finally, *ect* is defined as the error correction term.

To estimate the above models we applied the following equation for which the variables are as outlined above:

$$rgdpc = a_0 + a_1 rgdpc + a_2 gfcf + a_3 pvy + a_4 wedge + a_5 uc + a_6 int + a_7 openk \quad (14)$$

If it is assumed that the series in levels have unit roots and are co-integrated, the above Vector Error Correction Model (VECM) in (13, 14 & 15) can then be estimated. The causality in this case would entail imposing restrictions on the coefficients of the lags of the variables of interest. If say we want to test that a given Financial development proxy (e.g., pvy) does not cause $rgdpc$ in the above equation (13), the null hypothesis is expressed as:

$$H_0: C_{i3} = 0$$

where: c_i are coefficients of the all lagged values of Δpvy_{t-i} , ($i = 1, 2, \dots$) in the first row of the VECM. This entails testing the hypothesis that pvy does not Granger-cause $rgdpc$. The same kind of analysis is made on the second equation of the system where we test the hypothesis that $rgdpc$ does not Granger-causes $gfcf$. The null hypothesis in this case is:

$$H_0: C_{i3} = 0$$

To test the hypothesis that financial development does not Granger cause real per capita income one could use the deletion method or the WALD test. In our case we apply the WALD test method it doesn't matter. The rejection of the null hypothesis will simply imply that the causality inference does exist between the variables being tested.

As a way of checking out the consistency our empirical results, this causal relationship will also be looked into using the methodology proposed by Toda and Yamamoto (1995). This method is outlined below together with the model specification in matrix form.

4.4.7 Model Specification (Toda-Yamamoto)

The VECM discussed in the previous section permits inference on both short-run and, long-run linkages. While this has been proposed in the recent literature (see King, Plosser, Stock and Watson, 1991; Mosconi and Giannini, 1992; Toda and Phillips, 1993) and exhibits highly desirable properties both from a theoretical and empirical point of view, this formulation does have its drawbacks in that it is implicitly dependent upon pre-tests of integration and co-integration as mentioned in the previous section.

Furthermore, it is noted that there is significant reliance on pre-tests to provide an accurate report of the co-integration ranks. As we have already noted, even in the case where the error-correction term is appropriately derived, there is an additional step to augment this term in the original VAR formulation. Thus, the VECM formulation may involve implicit non-linear restrictions on parameter vectors, which may be problematical as tests for Granger non-causality

may involve size distortions due to rank deficiency. The basic necessity of this additional step of embedding an error-correction term arises from the need to re-capture the long-run information lost through differencing the variables entering the VAR. One way to circumvent this problem is to posit a VAR in which variables appear purely in their level form. However, while Sims, Stock and Watson (1990) do propose the asymptotic theory to validate appropriate Granger causality tests in level VARs, here there is also a pre-requisite that the system be co-integrated. Such tests, in particular the most popular being due to Johansen (1991), do tend to be sensitive to nuisance parameters and suffer from finite-sample biases (see Toda & Yamamoto, 1995).

Only recently has Toda and Yamamoto (1995) proposed a complementary procedure which allows causal inference to be conducted in level VARs that may contain integrated processes but does not involve rigorous attention and strict reliance upon integration and co-integration properties of any or all variables in the system. In essence, this procedure circumvents some of the pre-test biases that practitioners may be confronted with in VECM and other modelling formulations involving unit root and co-integration pre-testing.

The procedure of Toda-Yamamoto is simple and convenient to apply and permits linear as well as nonlinear tests of restrictions. These restrictions themselves would then imply long-run causal inference since, unlike ordinary difference VARs, this formulation involves only variables appearing in their levels. Toda and Yamamoto (1995) propose estimation of a levels' VAR of the form:

$$y_t = y_0 y_{1t} + \dots + y_q t^q + \theta_1 y_{t-1} + \theta_k y_{t-k} + \dots + \theta_p y_{t-p} + \xi_t \quad (15)$$

where $t = 1, \dots, T$ and $p \geq (k + d)$ consisting of y_t 's that are $I(d)$ which may be $ci(d, b)$. The θ 's are coefficient matrices but hypothesis testing of restrictions will preclude the terms $\theta_{k+1}, \dots, \theta_p$ which are assumed to be zero. In matrix notation, this may be written as:

$$y' = \Gamma \Lambda + \Phi X' + \Psi Z' + E' \quad (16)$$

where $\Gamma = (y_0, \dots, y_q)$, $\Lambda = (\tau_1, \dots, \tau_T)$ with $\tau_t = (1, t, \dots, t^q)'$, $\Phi = (\theta_1, \dots, \theta_k)$, $X_t = (x_1, \dots, x_T)$, with $x_t = (y'_{t-k}, \dots, y'_{t-k})'$. Toda and Yamamoto (1995) then show that the test of hypothesis $H_0: f(\phi)$, where $\phi = \text{vec}(\Phi)$ is a parameter vector which may be tested by a Wald statistic which is asymptotically chi-square with m degrees of freedom, subject to $p \geq k + d$. The statistic is given by:

$$w = f(\emptyset)'[F(\emptyset)\{\Gamma^{-1}E'E'\otimes(\times'Q\times)^{-1}\}F(\Phi)']f(\Phi) \quad (17)$$

where $Q = Q_\tau = Q_\tau Z(Z'Q_\tau Z)^{-1}Z'Q_\tau$ and $Q_\tau = I_T - \Lambda(\Lambda'\Lambda)^{-1}\Lambda'$, where I_T is a $T \times T$ identity matrix.

Effectively, this implies that all one needs to do is to determine the maximal order of integration $[d(max)]$ that we may believe the model to incorporate and ascertain the lag structure, and then construct a VAR with variables appearing in their levels with a total of $p = k + d(max)$ lags. However, at the inference stage, linear or non-linear restrictions should only be tested on the first (k) lags since the $p - k$ lags are assumed zero and ignored. The over-parameterization of the model is done intentionally, and the procedure will be valid as long as the order of integration does not exceed the true lag-length (k) of the model¹¹. According to Toda and Yamamoto (1995), the Wald statistic is shown to be valid in a wide variety of cases, regardless of any component in y being stationary (around a linear trend) $I(1)$, $I(2)$, non co-integrated or co-integrated of an arbitrary order¹².

Based on the above brief review, our second set of empirical analysis will be based on the following VAR models e.g. South Africa with a $k = 3$ and $dmax = 1$:

$$\begin{pmatrix} RGDPC_i \\ PVY_i \\ GFCF_i \\ WEDGE_i \\ UC_i \\ INT_i \\ OPENK_i \end{pmatrix} = A_0 + A_1 \begin{pmatrix} RGDPC_{i-1} \\ PVY_{i-1} \\ GFCF_{i-1} \\ WEDGE_{i-1} \\ UC_{i-1} \\ INT_{i-1} \\ OPENK_{i-1} \end{pmatrix} + A_2 \begin{pmatrix} RGDPC_{i-2} \\ PVY_{i-2} \\ GFCF_{i-2} \\ WEDGE_{i-2} \\ UC_{i-2} \\ INT_{i-2} \\ OPENK_{i-2} \end{pmatrix} + A_3 \begin{pmatrix} RGDPC_{i-3} \\ PVY_{i-3} \\ GFCF_{i-3} \\ WEDGE_{i-3} \\ UC_{i-3} \\ INT_{i-3} \\ OPENK_{i-3} \end{pmatrix} + A_4 \begin{pmatrix} RGDPC_{i-4} \\ PVY_{i-4} \\ GFCF_{i-4} \\ WEDGE_{i-4} \\ UC_{i-4} \\ INT_{i-4} \\ OPENK_{i-4} \end{pmatrix} + \dots + A_5 \begin{pmatrix} RGDPC_{i-5} \\ PVY_{i-5} \\ GFCF_{i-5} \\ WEDGE_{i-5} \\ UC_{i-5} \\ INT_{i-5} \\ OPENK_{i-5} \end{pmatrix} \quad (18)$$

where: A 's are seven by seven matrices of coefficients with A_0 an identity matrix.

¹¹ Note, however, that this is most unlikely to be the case in most empirical works. If $d=1$, then the procedure will always be valid since $k=1$. The one exception is in the case where $d=2$ and the true lag-length $k=1$.

¹² The Toda-Yamamoto procedure is similar to one proposed by Dolado and Lutkepohl, *Humoldt Univ Mimeo* (1994), which is also applicable to systems regardless of whether or not they are co-integrated. The approach is to basically augment a $VAR(p)$ model with a single additional lag making it $VAR(p+1)$ but at the inference stage, to test restrictions only up to the p -th term.

To test the hypothesis that Granger no-causality from say credit (*pv*) to growth (*rgdpc*), we test

$$H_0: \alpha_1^{(12)} = \alpha_2^{(12)} = \alpha_3^{(12)} = 0$$

where $\alpha_2^{(12)}$ are the coefficients of pv_{t-1} , pv_{t-2} , and pv_{t-3} respectively in the first equation of the system equation 1 where the system is being estimated as a VAR(4).

The existence of causal relationship from credit to growth can be established through rejecting the above null hypothesis which requires finding significance of MWALD statistic for the group of lagged independent variables identified above. A similar testing procedure can be applied to the other equations such as where credit, investment and wedge are dependant variables. For instance to test the alternative hypothesis that no Granger causality from growth to credit exists, we test the following hypothesis:

$$H_0: \alpha_1^{(12)} = \alpha_2^{(12)} = \alpha_3^{(12)} = 0$$

where $\alpha_i^{(12)}$ are coefficients of $rgdpc_{t-1}$, $rgdpc_{t-2}$, and $rgdpc_{t-3}$ respectively in the second equation of the system Equation 1 where the system is being estimated as a VAR(4).

While this method does circumvent some of the problems associated with pre-test bias from tests required for the VECM or Sims, Stock and Watson (1990) procedure, the issue of over-fitting the model does in itself entail a loss of power. Since the procedure is valid asymptotically, efficiency will also be affected in particular cases where the true lag-length may be as small as one, and augmenting additional lags in a small-sample VAR may prove to be costly in terms of parsimony. This, though, will not occur frequently in applied work using data with frequency greater than annual and orders of integration not exceeding two.

It is with these caveats in mind that in this study the second procedure will be applied as a complement to the VECM already proposed. In adopting the methodology as a complementary tool, the model employing a VAR in levels will add an extra dimension to the analysis in addition to providing us with another facet to assess the general robustness of the results generated from the VECM. Moreover, as Toda and Yamamoto (1995) remarked “...we are not suggesting that this method should totally replace the conventional hypothesis testing that are conditional on the estimation of unit roots and co-integrating ranks. It should rather be regarded

as complementing the pre-testing method that may suffer serious biases in some cases.” In this analysis, we are employing the Toda-Yamamoto methodology sharing a similar motivation.

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Chapter 5

Analysis and Results

5.1 Introduction

This chapter reports the results and implications of applying the models introduced in the previous chapter. Before tests on the relationship between finance and growth in so far as the direction of causality is concerned we conducted a number of preliminary tests. These include the unit root tests, PSS F-test, lag length test, co-integrating vector tests and last but not least the stability test. The test results presented in this thesis are in summary form, given the number of countries investigated and the large volumes of results generated. To that end the findings of some tests in this study are commented on but not fully reported.

The remainder of this chapter is therefore organised as follows. This chapter analyses the time series properties followed by causality tests using two different methods. Thus, section 5.2 analyses the time series properties of all the variables for modelling of finance-growth causal relationship of three sub-Saharan countries, Section 5.3 present the Pesaran, Shin and Smith PSS F-test and their results. Section 5.4 briefly discusses the VECM and in particular the issue of why the error correction term is so important. Section 5.5 to 5.7 presents the VECM test results for Kenya, South Africa and Zambia respectively. Finally, section 5.8 presents the Toda and Yamamoto results for all the three countries.

5.2 Data Motivation, Source and Description

The study applies a multivariate empirical analysis within a VAR model framework to examine the relationship between finance and growth for three sub-Saharan countries over a period of 39 years. Our analysis is based on seven variables that we define below.

The countries considered are: Kenya, South Africa, and Zambia. In each case the real data which is based on annual figures is applied. The adopted models relate to real per capital income, growth fixed capital formation, credit to the private sector by the commercial banks, wedge rate (i.e. difference between deposit and lending rates), financial uncertainty, real interest rates and openness of the economy.

Models applied in this section thus permit the testing of both the supply leading and demand following of causality based on the significance of the relevant coefficients in the co-integrating relations. The gross fixed capital formation, credit and wedge are included in our models because they have been identified as a major source of capital which leads to the growth of the economy (See Luintel & Khan, 1999, McKinnon, 1973 and Shaw, 1973). An increase in the credit and efficiency of financial market can cause an increase in capital from savers to the sectors of the economy where they are mostly wanted and can efficiently be used. As a result, the growth of the economy is expected to grow. The economy may also be found to cause the development of financial market if the economy can induce the institutions to do so via the proper policy framework, macroeconomic stability and demand for the financial products.

Coming back to the issue of data, we note the following: first, all our data is based on yearly intervals. Second, the time series available for all the three countries covers the sample period 1965 to 2004. And lastly, a number of other variables could not be included in our study such as the stock turn over as a percentage of GDP, black market premium and exchange rate. This was due to the fact that individual country datasets on these variables are more limited and have somewhat shorter sample periods. For instance, Zambia's stock market was only established in 1995 and Kenya's case though established long before independence lacks data. The data included in our models was obtained from the World Development Indicators International Financial Statistics and Penn World Tables and we outline their definitions below as follows:

5.2.1 Financial Development Indicators

Financial development is usually defined as a process that marks improvement in quantity, quality, and efficiency of financial intermediary services. This process involves the interaction of many activities and institutions. Consequently, it cannot be captured by a single measure. In this study we employ two measures of financial development for the purpose of testing the robustness of our findings.

According to Galetovic (1996), he divides those previously used financial development measures into three categories. The first category simply looks at interest rates, arguing that financially repressed economies generally exhibit very low, or even negative, real interest rates. We do not believe that interest rates constitute a satisfactory proxy for financial development since their links to the financial system are not straightforward.

Galetovic (1996) concludes that the second and third categories, intended to reflect the size of the financial system and the distribution of credit flows, respectively, are more relevant measures. The size of the financial sector may be measured, as in King and Levine (1993b), as the ratio of liquid liabilities to GDP. Another possibility is to use the money multiplier as an indicator of the financial system's capacity to create money and hence its financial depth. King and Levine (1993b) also use the ratio of domestic deposit money bank assets to total domestic bank assets arguing that the central bank generally performs other functions than investment financing. The latter approach would clearly be inappropriate in this context since most of the Reserve Banks in the three study countries performed many functions normally associated with commercial banks during the 19th century. Thus, despite the fact that all these measures provide a good first approximation of financial development, we think it is possible to find better measures of the financial system.

King and Levine (1993b) assume that credit provided to the private sector generates increases in investment and productivity to a much larger extent than do credits granted to the public sector. They also argue that loans to the private sector are scrutinised more carefully and that the improved quality of investment emanating from financial intermediaries' evaluation of project viability are more significant for private sector credits. Variables such as the ratio of financial sector claims on the private sector to either total domestic credit or real GDP are therefore likely to give a good approximation of the availability of funds to potential investors. Thus, for our first financial development proxy we adhere to King and Levine's (1993b) view and focus on the volume of credit granted by the financial sector to the private sector as a ratio of GDP.

For the second measure of financial development the thesis employed the Wedge. This measures the competitiveness of the banking sector system and in theory it is defined as the difference between bank deposit and bank lending rates. The motivation for using this proxy is that it is a good estimator for efficiency in the banking sector. For instance, when the wedge decreases due to transaction costs, this leads to the share of savings going to investments decreases. As postulated by the growth theory, economic growth is positively linked to the amount of investments; therefore, the decrease in transaction costs accelerates economic growth. This variable is thereby closely linked to the theoretical models of Blackburn and Hung (1998) and Harrison *et al.* (1999).

In previous studies of the impact of the financial system on economic performance, three different growth measures have been used, most commonly the per capita growth rate in real GDP (see Gelb, 1989; Roubini & Sala-i-Martin, 1992; King & Levine, 1993a, b; Demetriades & Hussein, 1996). Furthermore, since the study involves comparing three countries, the normalised proxy of income with respect to population is in this case the proper choice. When testing the principal hypothesis, that the financial system has exerted an influence on the development of real GDP, the thesis restricts the analysis to testing for the impact on per capita real GDP.

In addition to the real GDP per capita and the financial development indicator, we introduce a fourth variable to our VAR system, namely the share of gross fixed capital formation in GDP (GFCF). This variable is considered to be one of the few economic variables with a robust correlation to economic growth regardless of the information set (Levine & Renelt, 1992). Including the investment variable in our regressions enables us to identify the channels through which financial development causes economic growth. If financial development causes economic development given the investment variable, then this causality supports the endogenous growth theories that finance affects economic growth mainly through the enhancement of investment efficiency. Furthermore, an assessment of financial development causing economic growth through an increase of investment resources can be made, by testing the causality between financial development indicators and investment on the one hand and between investment and economic growth on the other.

The following controls variables are included in the regressions: openness variable is included in the model regression to account for the effects of international trade. Exports may positively affect growth if it increases the market for domestic product and generates foreign exchange reserves necessary to import capital goods. Imports can positively affect growth if increases in imports are associated with capital goods. However, openness can also affect growth adversely. The net effect can only be determined empirically. The variable we use to test this effect is the sum of imports and exports as a percentage of GDP.

Real Interest rate (*int*) is another control variable included in the model. Romer (1990) argues that with increases in the interest rate, agents discount future output relative to current output at a higher rate. This results in capital moving away from the production of knowledge-based goods toward more production of final goods. The consequence is a decline in economic growth.

To capture the instability of the financial sector, the financial instability proxied by (*uc*) was also included in the regression. Fedderke (2000) argues that investment is adversely affected by uncertainty. In view of this, we proxied for uncertainty a financial instability index. This is defined as the variance of the difference between the local interest and international interest rate (i.e., US \$ rate).

Due to the long time period covered, we introduce a number of dummy variables, all set at the value of 1 for the relevant period and 0 otherwise. The dummy variables used are listed in Table 22. All dummy variables were entered outside the co-integrating space, thus reflecting changes in the drift of the variables. Dummy variables are not included unless the coefficient is significantly different from zero or they improve the residual properties.

Table 22: Dummy variables

Country	Variable	Year equal to 1
Kenya	D74	1976-2004
	D94	1995-2004
Zambia	Dum75	1976-2004
	Dum92	1993-2004
South Africa	DT80	1981-2004
	Gold	1965-1980
		1985-2004

In each country two dummies were included. For instance, in the case of South Africa the two dummies included took care of two structural breaks that have had an effect on the investment rate and financial development variables and interest rate. We therefore applied the dummy of *DT80* which took care of the structural break attributed to the financial liberalisation of the 1980s. The other intervening dummy included in the model of South Africa is one which captures the gold price boom and this affected the investment rate between 1981 and 1984 period.

Regarding Kenya, two structural breaks were considered too. The first one was in 1974 while the second one was in 1994. The dummy *D94* took care of the break attributed to a general decline in interest rates in 1994 and also an increase in cash ratio following the trade liberalisation activities and relaxation of the cash ratio. Dummy *D74* was included in order to capture the shock due to oil prices which affected the country during the period of 1974.

In the case of Zambia, two dummies were also included in the regression model. These include *dum75* and *dum92*. Dummy *dum75* is used to capture the world oil price shock which also affected Zambia too. The other dummy is included to capture the shock due to financial liberalisation which started in earnest in 1992.

Apart from these six dummies no other deterministic variables were included because they were considered insignificant and we were mindful of the short sample size available. Subsequently and on the basis of our observation that the plot of the data over the period under study indicated no upward or downward trends in differenced form, and the a priori knowledge on the finance and growth relationship, the VAR was estimated without a deterministic trend for the finance-growth nexus. However no a priori restrictions on intercepts were assumed and the VAR was estimated with unrestricted intercepts to account for the constant in the equation.

On the basis of these seven variables, co-integration analysis was carried out using the VAR modelling process starting with unit root test.

5.2.2 Unit Root Tests

The development of the concept of unit root and indeed co-integration has had an important impact on the time series analysis of economic data, particularly on econometric practice. Time series modelling requires the data generating processes of the series and structural relationship described by the model to be invariant with respect to time. If the underlying stochastic processes of the time series are non stationary, it would be difficult in modelling the series with an equation that has fixed coefficients estimated from past data. In addition as stated in chapter 4, regressing non-stationary time series data against another can lead to spurious results and biased conventional significance tests.

Thus, to test if a time series is stationary or not, this study applied the Augmented Dickey-Fuller (ADF) test, which examines the hypothesis that the variable in question has a unit root. If the time series is found to have a unit root, differencing the data may be appropriate before

performing the regression analysis. By contrast, if the variables are found to be stationary, it is not necessary to proceed and test for co-integration since classical regression methods of estimation such as OLS are appropriate and can be applied to stationary variables in levels. Ultimately, if the variables are found to be integrated at different orders, it is possible to conclude that various subsets of variables under consideration may be co-integrated (only where there are more than two variables under consideration). However, further analysis would obviously be required to test this conjecture.

With regard to the analysis of data, the first step taken was examination of the series through graphical inspection of their time series plots. These variables include real per capita product (*rgdpc*), real gross fixed capital formation (*gfcf*), interest rates (*wedge*), Credit to the private sector by the commercial Banks (*pvv*), financial instability(*uc*) real interest rates (*int*) and openness of the economy(*openk*). The series are expressed in logarithms and are in annual rates of growth covering the period 1965 to 2004 as mentioned previously.¹³

The graphical inspections of all the variables in levels clearly suggest that some of the series are linearly trended. Given that each variable seems to have a non-constant mean, it appears then that the variables are not stationary in levels, meaning that their distribution depends on time. For more details see the plots of the core variables under scrutiny in figure 13, 14 and 15 of the annex.

Following graphical evidence it is always useful as a first approximation to data investigation to also test. This argument is based on the fact that most economists agree that graphical inspection is at times unreliable method to use to make inferences about unit roots and as a result formal testing procedures are usually employed (see, Harris, 1995).

5.2.3 Testing for Unit Roots Using ADF Test

Table 23 presents the results in both levels as well as differenced form using augmented Dickey Fuller (ADF) tests. In this Table T and NT stands for trend and no trend respectively.

Result from all the seven variables in each of the three study countries shows that the null hypothesis cannot be rejected for any of the variables under scrutiny. In addition, when differenced form of the variables is considered, the tests strongly reject the unit root which means that variables are integrated of order ***I*(1)** at the 5 percent confidence level.

¹³ The proxy wedge is used interchangeably with spread.

Table 23: Results of ADF Unit Root Test

Country	Variables	Levels	1 st Difference
Aug Dickey-Fuller statistic			
Kenya	<i>rgdpc</i>	T	-2.67
	<i>gfcf</i>	NT	-3.43
	<i>pvy</i>	T	-2.04
	<i>wedge</i>	NT	-1.33
	<i>uc</i>	NT	0.99
	<i>openk</i>	NT	-1.49
	<i>int</i>	NT	-3.31
South Africa	<i>rgdpc</i>	T	1.90
	<i>gfcf</i>	T	3.24
	<i>pvy</i>	T	0.57
	<i>wedge</i>	NT	-2.68
	<i>uc</i>	T	-1.86
	<i>openk</i>	T	-0.99
	<i>int</i>	NT	2.89
Zambia	<i>rgdpc</i>	T	-1.29
	<i>gfcf</i>	T	-1.34
	<i>pvy</i>	T	-1.42
	<i>wedge</i>	NT	-1.20
	<i>uc</i>	T	-1.71
	<i>openk</i>	T	-2.69
	<i>int</i>	NT	-2.91

Note: Mackinnon (1991) critical values are -3.50 in levels and -2.92 for the 1st difference.

However, it is important to note that in the entire seven variables, irrespective of the order of the augmentation chosen, both tests, i.e. the DF and the ADF statistics, are well below the 5 percent critical values. These unit root test results also corroborate well with the findings in most empirical studies. That is with most macroeconomic series, the variables under consideration in this study appear to be non-stationary in levels. Only in their first differences are they stationary.

Thus, considering the fact that the data appear to be stationary in first differences, no further tests were performed on these series with regard to the issue of stationarity.

In summary, the reviewed time series properties of data imply the following two issues:

- First, taking all the results together, it is not plausible for the variables included in the three countries to exclude the possibility of a single unit root.
- Second, the evidence that the variables are described by an $I(1)$ process is strong and this is based on the consistent results of these empirical tests. So in the interests of parsimony,

the results of these unit root tests and the a priori knowledge that all the seven variables in each country, like the case is in most time series data are generally considered to be integrated of order one, the null hypothesis of stationarity (in 1st difference) was accepted for all variables under consideration, without any exception at all.

Accordingly, the rest of the analysis in the VECM apart from those of PSS-Test and Toda-Yamamoto proceeded under the assumption that the time series relevant for our co-integration tests are all integrated to the same order $I(1)$, which of course is a necessary condition in time series for testing for co-integration relationships.

Prior to the estimation of the VECM using Johansen procedure we tested all our three models using Pesaran, Shin and Smith, (1996) methodology. This is necessary in order to find out if the system of our equations contains a unique co-integrating vector. If a unique co-integrating vector is found then the autoregressive-distributed lag (ARDL) method which was developed by Pesaran *et al.* could be used to model finance and growth relationship. However, if more than one co-integrating vector is found then the Johansen FILM VECM's co-integration technique is applied. Below we briefly outline the PSS F-test and its test results.

5.3 Pesaran, Shin, Smith (PSS) ARDL Results

The application of the PSS ARDL technique as outlined in section 4.4.3 of chapter 4 of the thesis was applied in this analysis in order to select the so-called 'forcing variables'. Besides, since the choice of the orders of the lagged differenced variables in the unrestricted ECM specification can have a significant effect on the test results, the log form of variables were estimated for the orders $p = q = 1, 2$.

In modelling the finance and growth following PSS ARDL method, the analysis was strictly guided by the combination of theory as well as the empirical test findings. The estimations, like all other computations in this thesis, were carried out using the program Microfit 4.0 (see Pesaran and Pesaran, 1997).

Data analysis gave information as to which type of the models fit Kenya, South Africa and Zambia's data best. In so doing we also investigate whether a unique co-integrating vector in each model does exist. Tables 37, 38 and 39 report the empirical realisations of the F-statistics for testing the existence of a long-run relationship between financial development and economic growth. In all three cases, the underlying equations passed the usual diagnostic tests for serial

correlation, functional form misspecification and for non-normal and/or heteroskedastic disturbances. The 90, 95 and 95.7 percent lower and upper critical values bounds of the F-test statistic that are dependent on the number of regressors on whether a linear trend is included or not, are originally given in Table B in Pesaran, Shin and Smith (1996) and usefully summarised in Pesaran and Pesaran, 1997.

Results from the first model which presupposes that $\ln rgdpc$ is determined by $\ln rgdpc, \ln gfcf, \ln pvy, \ln wedge, \ln uc, \ln int, \ln openk, dum75$ and $dum94$ are presented below (see Table 24). In the second hypothesis $\ln gfcf$ is determined by $\ln rgdpc, \ln gfcf, \ln pvy, \ln wedge, \ln uc, \ln int, \ln openk, dum75$ and $dum94$. Regarding the third equation of $\ln pvy$ it is determined by $\ln rgdpc, \ln gfcf, \ln pvy, \ln wedge, \ln uc, \ln int, \ln openk, \ln int$ and $dum94$.

Finally, $\ln wedge$ is determined by $\ln rgdpc, \ln gfcf, \ln pvy, \ln wedge, \ln uc, \ln int, \ln openk, \ln int$ and $dum94$.

Table 24: F-statistic values
F-Statistics for co-integration relationship of Kenyan model

Critical value bounds of the F-Statistic with constant and trend						
	90%		95%		97.5%	
k	$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
9	2.192	3.285	2.467	3.614	2.723	3.898
Calculated F -statistic:						
$F_{\ln rgdpc}(\ln rgdpc \backslash \ln gfcf, \ln pvy, \ln wedge, \ln uc, \ln int, \ln openk, dum75, dum94 = 5.376)$						
$F_{\ln gfcf}(\ln gfcf \backslash \ln rgdpc, \ln pvy, \ln wedge, \ln uc, \ln int, \ln openk, dum75, dum94 = 4.7814)$						
$F_{\ln pvy}(\ln pvy \backslash \ln rgdpc, \ln pvy, \ln wedge, \ln uc, \ln int, \ln openk, dum75, dum94 = 2.5426)$						
$F_{\ln wedge}(\ln wedge \backslash \ln rgdpc, \ln pvy, \ln wedge, \ln uc, \ln int, \ln openk, dum75, dum94 = 1.3606)$						

What emerges from the comparison of F-statistics with the critical values is that:

- ❖ $\ln rgdpc = 5.376 > F_u = 3.614$ indicating the presence of a long-run relationship,
- ❖ $\ln gfcf = 4.7814 > F_u = 3.614$ also indicating the existence of a long-run relationship.
- ❖ In the case of the $\ln pvy$ we found that $\ln pvy = 2.5426$ and falls between $F_U = 3.614$ and $F_L = 2.467$. Since the estimated value is $F_L < \hat{F} < F_U$ the test is

inconclusive about the existence of the long-run regarding the underlying variables.

- ❖ Finally, $lnwedge = 1.36 < 2.467$ indicating the absence of long-run relationship.

The results in (Table 25: F-statistic values) seem to suggest the existence of at least two co-integrating vectors.

With regard to the South African model the various F-statistics in Table 38 were compared with the critical value bounds provided by Pesaran *et al.*, as follows:

- ❖ $lnrgdpc = 8.002 > F_u = 3.349$ indicating the presence of a long-run relationship,
- ❖ $lngfcf = 3.891 > F_u = 3.349$ also indicating the existence of a long-run relationship.
- ❖ $lnpvy = 3.773 > F_u = 3.349$ which also confirms the existence of a long-run relationship.
- ❖ Finally, $lnwedge = 1.958 < F_l = 2.163$ indicating the absence of long-run relationship.

Table 25: F-statistic values
F-Statistics for co-integration relationship of South African model

Critical value bounds of the F-Statistic with constant and no trend						
	90%		95%		97.5%	
k	$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$
9	1.899	3.047	2.163	3.349	2.437	3.657

Calculated F -statistic:

$$F_{lnrgdpc}(lnrgdpc \setminus lngfcf, lnpvy, lnwedge, lnuc, lnint, lnopenk, dt80, gold = 8.002)$$

$$F_{lngfcf}(lngfcf \setminus lnrgdpc, lnpvy, lnwedge, lnuc, lnint, lnopenk, dt80, gold = 3.891)$$

$$F_{lnpvy}(lnpvy \setminus lnrgdpc, lnpvy, lnwedge, lnuc, lnint, lnopenk, dt80, gold = 3.773)$$

$$F_{lnwedge}(lnwedge \setminus lnrgdpc, lnpvy, lnwedge, lnuc, lnint, lnopenk, dt80, gold = 1.958)$$

The results obtained above seem to suggest that in the case of the South African model we have three co-integrating vectors.

Finally, in the Zambian case, the following long-run co-integration relationships are reported:

- ❖ $lnrgdpc = 3.546 < F_u = 3.614$ indicating the absence of a long-run relationship,

- ❖ $lngfcl = 4.896 > F_u = 3.614$ indicating the existence of a long-run relationship.
- ❖ $lnpvyl = 3.687 > F_u = 3.614$ which also substantiates the existence of a long-run relation.
- ❖ Finally, the computed estimate of $lnwedg = 3.264$ and falls between $F_l = 2.467$ and $F_u = 3.614$ thereby indicating that the test is inconclusive about the existence of the long-run regarding the underlying variables.

Table 26: F-statistic values
F-Statistics for co-integration relationship of Zambian model

Critical value bounds of the F-Statistic with constant and trend						
	90%		95%		97.5%	
K	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
9	2.192	3.285	2.467	3.614	2.723	3.898
<i>Calculated F-statistic:</i>						
$F_{lnrgdpc}(lnrgdpc \backslash lngfcl, lnpvyl, lnwedg, lnuc, lnintl, lnopenk, dum92, dum75 = 3.546)$						
$F_{lngfcl}(lngfcl \backslash lnrgdpc, lnpvyl, lnwedg, lnuc, lnintl, lnopenk, dum92, dum75 = 4.896)$						
$F_{lnpvyl}(lnpvyl \backslash lnrgdpc, lnpvyl, lnwedg, lnuc, lnintl, lnopenk, dum92, dum75 = 3.687)$						
$F_{lnwedg}(lnwedg \backslash lnrgdpc, lnpvyl, lnwedg, lnuc, lnintl, lnopenk, dum92, dum75 = 3.264)$						

The conclusion drawn from the results presented in above (Table 26: F-statistic values) show that in the case of Zambia it appears there are at least three co-integrating vectors (CVs) present in the model.

In summary using PSS *F-test* we find that in each model more than one long-run relationships existing. Consequently using this method of PSS ARDL failed to proceed with the test of causality relationship between finance and growth. This is because of the fact that no unique co-integrating vector was found but instead there was a possibility two or three co-integrating vectors in each model (Pesaran & Shin, 1999).

Despite this drawback with the PSS methodology it has however given us two most important leads: (1) an idea as to how many relationships we expect to have from each model and (2) which variables we have to treat as dependant variables. From this point of view and in order for us to identify the most economically meaningful relationship of causal inference between the variables of interest we now turn to Johansen technique, the methodology normally employed

when more than one co-integrating vector is identified. Thus, before proceeding with the test of causality using VECM we followed steps outlined in section 4.4.5 starting with test of the order of the VAR.

5.4 Estimation of the Models

Given the non-stationarity of all the seven variables for the countries considered, the vector of real per capita income, investment and credit is viewed as a system of possibly co-integrated variables (Engle & Granger, 1987). As such the number of co-integrating relationships between them was estimated. The Johansen maximum likelihood procedure (1992) was used to estimate the number of co-integrating vectors and to derive a likelihood ratio test for the null hypothesis that there are a given number of these relationships. In addition to basing our conclusion on the empirical results we also used the a priori information based on the theory of causal relationships between finance and growth. As the specific country approach was used to investigate the propositions under study because the findings are intended to benefit national policy makers, the results are reported on a country-by-country basis starting with the test of order of the VARs for all three countries.

5.4.1 Tests for the Order of the VARs

From the pre unit root tests conducted on all our series in section 5.2.2 we note that all the seven variables in each country's model were found to be of order $I(1)$. In addition to the non-stationarity of the variables we included a constant μ in the underlying VARs. Dummies were also considered in all the three cases to capture the effects of the structural breaks as pointed out earlier in this chapter.

In line with common empirical practice, the order of VAR k was chosen using the Akaike Information Criterion or the Schwartz Bayesian Information Criterion subject to the lag length choice passing the L.M test for the absence of serial correlation. For instance in all three countries, consideration of the Akaike Information Criterion generally suggested an optimal VAR order of 4, 2 and 3 for Kenya, Zambia and South Africa respectively, while the Schwartz Bayesian Information Criterion generally suggested a VAR of order 1 in all three sets. One important issue to note here is that we have to avoid over parametising the model and equally true is the argument that we have to avoid using a VAR with $k = 1$. This is all based on the fact that we have small sample size and the choice of VAR of order 1 is not very useful as in this case there would not be lagged first differenced values in the VECM to perform our analysis on.

So in the assessment of the order of the lag length we start with a lag order of 2 and check the residuals of the individual equations with respect to serial correlation. Knowing that this test has two versions, this study only employed one of them which is LM-test. Furthermore, the interpretation of the test statistics follows the test of the null hypothesis that there is essentially ‘no problem’, so it is desirable that the probability value is greater than 5%.

From the results presented in Annexure A (Table (36, Table (37 and Table (38 for Kenya, South Africa and Zambia respectively, we note that there is no problem with respect to serial correlation over the sample period of 1965-2004 when a VAR of order 2 was considered for each country. As a result we concluded that a VAR of order two was a reasonable choice in all three models and consequently proceeded to estimating the VECM with the lag order of 2 starting with Kenya, South Africa and then Zambia.

5.5 Kenya

According to the representation theorem, if series are co-integrated, Granger causality will further require the inclusion of error correction terms (ECT) in the stationary model in order to capture the short-term deviation of series from their long-term equilibrium path. In fact, the evidence of co-integration between variables rules out the possibility of Granger non causality, although it does not say anything about the direction of the causality. In this case, the application of a vector error correction model (VECM) will enable both the direction of the causality to be revealed, and to distinguish between short-run and long-run Granger causality. Taking this view, causality can be derived through: a) the χ^2 test of the joint significance of lags of other variables (Wald test), and b) the significance of the lagged error correction terms (t -test).

The system of equations applied to test the finance-growth relationship hypothesis in Kenya is defined as:

$$\Delta x_t = \delta + \sum_{i=1}^{\rho+1} \Gamma_i \Delta x_{t-1} + \Pi x_{t-\rho} + \Psi D_t + \varepsilon_t \quad (19)$$

where $x_t = \ln r g d p c, \ln g f c f, \ln p v y, \ln w e d g e, \ln u c, \ln i n t, \ln o p e n k$, Γ and Π represent short and long-run coefficients and δ is a constant term. We note too that Π is a $p \times p$ matrix. The rank r of matrix Π is equal to the number of co-integrating vectors. The hypothesis of co-integration in this regard is the hypothesis of the reduced rank of Π and specifically:

$$H_1(r): \Pi = \alpha\beta \quad (20)$$

where α and β are $p \times r$ matrices of the full rank. The β in this case refers to the co-integrating parameters and α measures the speed of adjustment towards the long-run equilibrium and is called a loadings.

To ascertain the existence of long-run relationships among the variables, the Johansen co-integration test was implemented. The estimated trace (λ_{trace}) and maximal eigenvalue (λ_{max}) test statistics and their corresponding 5% critical values are reported in Table 27. The trace statistic tests the null hypothesis that the number of co-integrating vectors, or rank (Π), is less than or equal to r (where $r = 0, 1, \dots, k - 1$ for k endogenous variables) against the general alternative that the number of co-integrating vectors is greater than r (i.e., $\lambda_{trace} \rightarrow H_0$): rank (Π) $\leq r$; H_1 : rank (Π) $\geq r + 1$. The maximal eigenvalue statistic tests the same null hypothesis against the alternative that the number of co-integrating vectors is equal to $r + 1$ (i.e., $\lambda_{max} \rightarrow H_0$): rank (Π) $\geq r$; H_1 : rank (Π) $\geq r + 1$.

Table 27: Johansen estimates for Kenya

Null	Alternative	Statistic	95% CV	90% CV
Co-integration LR test based on maximal Eigenvalue statistics				
$r = 0$	$r = 1$	87.5819	45.6300	42.7000
$r \leq 1$	$r = 2$	53.5903	39.8300	36.8400
$r \leq 2$	$r = 3$	41.9428	33.6400	31.0200
$r \leq 3$	$r = 4$	24.6741	27.4200	24.9900
$r \leq 4$	$r = 5$	13.8602	21.1200	19.0200
Co-integration LR test based on trace statistic				
$r = 0$	$r = 1$	236.5530	124.6200	119.6800
$r \leq 1$	$r = 2$	148.9711	95.8700	91.4000
$r \leq 2$	$r = 3$	95.3808	70.4900	66.2300
$r \leq 3$	$r = 4$	53.4381	48.8800	45.7000
$r \leq 4$	$r = 5$	28.7640	31.5400	28.7800

Order of the VAR=2. Variables included in the CV: lngdpc, lngfcf, lnpvy, lnwedge, lnint, lnopenk, dum75 & dum94.

Based on the results in Table 27 it is noted that whereas the maximal eigenvalue test suggests that there are only three co-integrating relationships among the variables, the trace test indicates there are four co-integrating relationships among the variables. From the discussions on the theoretical and empirical literature expounded in Section 3, the a priori expectation is that we should have three CVs based on the bidirectional and indirect causal relations between finance

and growth. It may therefore be inferred that there are three types of competing relationships between financial development and economic growth. Consequently the model accepted is that of the maximal eigenvalue test and concluded that we have three co-integrating relationships among the variables. It means therefore that six restrictions and three normalisations have to be imposed so as to exactly identify the long-run model before testing for over-identifying restrictions. Below in (Table 27: Johansen estimates for Kenya) we report the co-integration results based on Johansen ML procedure.

5.5.1 Identification of Long-Run Model

The Johansen's approach together with the PSS *F-tests* enabled us to establish the three co-integrating vectors for Kenya's model. And following on the identification of the co-integrating vectors we proceeded to imposing nine restrictions three of which were normalised on the β_s (i. e. $lnrgdpc$, $lngfcf$, and $lnpvvy$) in order to just identify the model of interest.

As a result, of six restrictions and three normalisations on $lnrgdpc$, $lngfcf$, and $lnpvvy$, we got the following just identifying model which we reported in equation 21, 22 and 23 below:

$$lnrgdpc = 0.95lngfcf + 0.79lnpvvy - 0.01lnint + 0.16lnopenk \quad (21)$$

$$lngfcf = 0.84lnrgdpc - 0.62lnpvvy - 0.04lnuc + 0.02lnint \quad (22)$$

$$lnpvvy = 1.31lnrgdpc - 1.54lngfcf - 0.11lnwedge + 0.06lnuc \quad (23)$$

where the log likelihood function (LL) subject to just-identifying restrictions as reported in our output is equal to 62.8398.

The first vector of equation 21 represents the real per capita income conditioned on investment, real interest rates, private credit and openness. All the coefficients in this CV have the expected signs. Vector 2 stands for the gross fixed capital formation in which two of the coefficients for real per capita income and the uncertainty have the right signs. However, in this second co-integration vector the private credit and real interest rates appear to have wrong signs. In Vector 3 which stands for private credit, the real per capita income, wedge and uncertainty all have the correct signs with the exception of gross fixed capital formation which have a wrong negative sign. However, since the above exact identifying restrictions do not impose any testable restrictions on the co-integrating VAR, over-identifying restrictions based on the three long-run theories under study, where imposed on the co-integrating vectors (CVs) in order to test their validity.

The above over-identifying restrictions to have equal coefficients on $lngfcf$ and $lnpvpy$ yielded a system of vectors depicted in the matrix 28. This model was easily accepted with the log likelihood ratio (LR) statistic for testing these restrictions computed to be 0.087160 [0.768] thereby giving rise to the preferred model of the long-run financial development and economic growth for Kenya.

$$\beta_s = \begin{pmatrix} & cv_1 & cv_2 & cv_3 \\ lngdpc & 1 & -.91 & -1.21 \\ & (0.24) & (0.40) & \\ lngfcf & -.85 & 1 & -1.36 \\ & (0.21) & (0.72) & \\ lnpyy & -.85 & -.74 & 1 \\ & (0.21) & (0.74) & \\ lnwedge & 0 & 0 & 0.12 \\ & (none) & (none) & (0.10) \\ lnuc & 0 & 0.05 & 0.07 \\ & (none) & (0.02) & (0.05) \\ lnint & 0.1 & 0.03 & 0 \\ & (0.200) & (0.20) & (none) \\ lnopenk & -0.18 & 0 & 0 \\ & (0.31) & (none) & (none) \end{pmatrix} \quad (24)$$

where LR test restriction $CHSQ(1) = 0.087160 [0.768]$.

The above three long-run co-integrating vectors can be expressed in three equations in which all the coefficients of the explanatory variables appear to have correct signs.

$$lngdpc = 0.85lngfcf + 0.85lnpyy - 0.1lnint + 0.18lnopenk \quad (25)$$

$$lngfcf = 0.91lngdpc + 0.75lnpyy - 0.05lnuc - 0.01lnint \quad (26)$$

$$lnpyy = 1.21lngdpc + 1.36lngfcf - 0.12lnwedge - 0.07lnuc \quad (27)$$

Caution must be exercised, however, when interpreting the results unearthed in the above system of equation. The reason is that although the co-integration implies positive relations between the three variables of interest (i.e. income, financial development and investment), co-integration tests cannot determine the direction in which causality flows. The causality relationships can be

ascertained from performing Granger-causality tests that incorporate the co-integrating relation. This is what we do next in section 5.5.2.

After identifying the system of equation as shown in equations 25, 26 and 27, a natural step is to examine both the long-run and short-term dynamics that are influenced by temporary deviations. To do this we formulate a vector error correction model. According to the VECM also known as the Granger representation theorem, if the series are co-integrated as is the case here, Granger-causality will further require the inclusion of the error correction terms in the stationary model in order to capture the short-term deviation of series from their long-term equilibrium path. In fact, as pointed out in section 4 the evidence of co-integration between variables rules out the possibility of Granger non causality, although it does not say anything about the direction the causality. In this case, the application of a vector error correction model (VECM) will enable both the direction of causality to be revealed, and to distinguish between short-run and long-run Granger causality. Taking this view, we present the vector error correction modelling results in Table 28 below.

5.5.2 The Vector Error Correction Model

As stated in the previous section we formulated the VECM in order to examine both the short-run and long-run dynamics of causality. In this case we note that short-term dynamics are influenced by temporary deviations from the long-run relationship (Table 28).

Concerning the long-run causality, the t -statistics for the ECT show that all the three error terms i.e. $ecm1(-1)$, $ecm2(-1)$, and $ecm3(-1)$ are statistically significant in the real GDP per capita and investment equation. However, in the credit equation, no error correction term appears to be significant. These results would imply that a long-run causal relationship running from $lnpvpy$ to $lnrgdpc$ exists, although not in the opposite direction, that is, from $lnrgdpc$ to $lnpvpy$ (as $lnrgdpc$ is not statistically significant in the c_3). This finding is based on the fact that the t -statistic of the error correction term in the c_3 was not statistically significant. Furthermore, these results seem to suggest that there is a two way causality existing in the long-run between $lnrgdpc$ and $lngfcf$. The results therefore do not lend support to the claims that economic growth precedes financial development in the case of Kenya. Conversely, $lngfcf$ and $lnpvpy$ seems to cause and precede real per capita income.

With regards to the short-run causality the χ^2 -test of the lags of the differentiated variables show that a causal relationship running from $lnwedge$ to $lngfcf$ exists. We also found evidence of a

short-run influence of *lnrgdpc* and *lnwedge* on the dynamic behaviour of *lnpvy*. Finally, the results from the VECM seem to show that in the long-run supply-leading hypothesis is supported as financial development seems to lead economic using both the financial development proxies. While in the short-run it's the demanding-following hypothesis which is supported by the empirical results.

Table 28: Granger-Causality Tests on VECM

Sources of causation	Full Model		
	$\Delta \ln rgdpc$	$\Delta \ln gfcf$	$\Delta \ln pvy$
Short-run			
$\Delta \ln rgdpc$	-	CHSQ(1) 1.14(0.29)	CHSQ(1) 6.13(0.01)
$\Delta \ln gfcf$	CHSQ(1) 0.68(0.41)	-	CHSQ(1) 0.42(0.52)
$\Delta \ln pvy$	CHSQ(1) 0.04(0.85)	CHSQ(1) 0.04(0.85)	-
$\Delta \ln wedge$	CHSQ(1) 2.53(0.11)	CHSQ(1) 3.37(0.07)	CHSQ(1) 5.08(0.02)
Long-run ECT			
$ECM1(-1)$	-2.57 ^a (-1.21)	-2.21 (-2.86)	-1.02 (-1.25)
$ECM2(-1)$	-2.57 ^a (-0.60)	-2.20 (-0.36)	-0.87 (-0.51)
$ECM2(-1)$	-2.28 ^a (-0.41)	-2.32 (-1.10)	-1.16 (-0.52)

In the case of short-run estimates, figures in parentheses are the coefficient terms, while for the error terms the terms in parentheses are *p*-values.

In summary the results tabulated in Table 28: Granger-Causality Tests on VECM) seem to support the existence of unidirectional causal relation between finance and growth hypothesis in both the short-run and long-run. What is clearly highlighted in above VECM is that in the short-run it's the demand-following hypothesis which is supported by the Wald-test results. While bank credit to the private sector, gross fixed capital formation and the wedge primarily influence real economic activities in the long-run, as can be seen by significance of the components of the lagged error-correction terms. However, the results show that the magnitude of these responses are rather high, suggesting that the gross fixed capital formation, credit to the private sector and wedge to growth substantially determine the size of the economic activity.

These results are not surprising given the close relationship of the financial intermediary (i.e. banking sector) with industry in Kenya. Our findings are broadly consistent with the view that the financial systems are more likely to promote long-run economic growth. Similar findings are reported by Luintel and Khan (1999), Arestis and Demitriades (1997), Arestis *et al.* (2001).

5.6 South Africa

With regard to the South African case a similar system of equations as the one applied for in Kenya was used to test the finance-growth relationship and the model was defined as follows:

$$\Delta x_t = \delta + \sum_{t=1}^{\rho+1} \Gamma_i \Delta x_{t-1} + \Pi x_{t-\rho} + \Psi D_t + \varepsilon_t \quad (28)$$

where $x_t = \ln r g d p c, \ln g f c f, \ln p v y, \ln w e d g e, \ln u c, \ln i n t, \ln o p e n k$, Γ and Π representing short and long-run coefficients and δ is a constant term.

As already pointed in section 5.4.2 the results of the tests to determine the order of VAR using both the AIC and SBC criteria select 2 as the appropriate order of the VAR. Diagnostic tests (the LR test) for possible serial correlation in the residuals of the individual equation suggests that serial correlation is not a problem in a statistical sense. Using model (28) defined above, we report the CV results based on both Eigenvalues and trace statistics.

Table 29, presents the co-integration rank statistics defined by the eigenvalue and the trace statistics respectively, together with the corresponding asymptotic critical values at the 0.05 and 0.10 significance levels reproduced using 2 as the order of the VAR. Both statistics reject the hypothesis that there is no co-integration relationship between the seven $I(1)$ variables under investigation. However, the eigenvalue statistic could not reject $r \leq 3$ just as the case was for trace statistic which failed too to reject $r \leq 4$. Despite these conflicting results, we however settled for trace statistic results which seems to agree with economic theory, that there should be three long-run (co-integrating) relations namely: demand-following, supply-leading and the indirect causal relations,

Based on the above empirical results and theoretical underpinnings that variables move together in the long-run (i.e. they are co-integrated) we proceeded further with the analysis in an attempt to unearth these long-run relationships.

Table 29: Johansen estimates – South Africa

Null	Alternative	Statistic	95% CV	90% CV
Co-integration LR test based on maximal Eigenvalue statistics				
$r = 0$	$r = 1$	57.9136	42.3000	39.3900
$r \leq 1$	$r = 2$	42.4959	36.2700	33.4800
$r \leq 2$	$r = 3$	31.1341	29.9500	27.5700
$r \leq 3$	$r = 4$	23.0227	23.9200	21.5800
$r \leq 4$	$r = 5$	14.1567	17.6800	15.5700
Co-integration LR test based on trace statistic				
$r = 0$	$r = 1$	177.4022	110.1000	105.4400
$r \leq 1$	$r = 2$	119.4887	83.1800	78.4700
$r \leq 2$	$r = 3$	76.9928	59.3300	55.4200
$r \leq 3$	$r = 4$	45.8587	39.8100	36.6900
$r \leq 4$	$r = 5$	22.8360	24.0500	21.4600

Variables included in the co-integrating vector: *lnrgdpc*, *lngfcf*, *lnpvpy*, *lnwedge*, *lnint*, *lnopenk* & *lnuc*.

5.6.1 Identification of Long-Run Model for RSA

In order to estimate the possibility of the long-run relationship and to enable us to extract the three structural relationships imbedded in the co-integrating space, we imposed some assumptions based on the identifying restrictions. The fact that results reveals three co-integrating vectors we imposed six restrictions and three normalisations on *lnrgdpc*, *lngfcf* and *lnpvpy*. The restrictions as mentioned before were imposed so as to identify the long-run model and this yielded the exactly identified estimates as illustrated in the following vector (29).

$$\beta_s = \begin{pmatrix} & cv_1 & cv_2 & cv_3 \\ lnrgdpc & 1 & -.66 & -1.06 \\ & & (0.04) & (0.07) \\ lngfcf & .78 & 1 & -1.54 \\ & (4.17) & & (0.15) \\ lnpsy & 2.52 & -.74 & 1 \\ & (3.20) & (0.04) & \\ lnwedge & 0 & -.27 & -.42 \\ & (none) & (0.06) & (0.08) \\ lnint & 0.15 & 0 & 0 \\ & (0.28) & (none) & (none) \\ lnopenk & 0 & -.11 & 0 \\ & (none) & (0.09) & (none) \\ lnuc & 0.33 & 0 & 0.02 \\ & (0.66) & (none) & (0.02) \end{pmatrix} \quad (29)$$

LL subject to exact identifying restrictions = 222.3971. The above matrix can be written in the usual way as:

$$lnrgdpc = -0.78lngfcf + 2.25lnpsy - 0.15lnint - 0.33lnuc \quad (30)$$

$$lngfcf = 0.66lnrgdpc - 0.71lnpsy + 0.27lnwedge + 0.11lnopenk \quad (31)$$

$$lnpsy = 1.06lnrgdpc - 1.54lngfcf + 0.42lnwedge - 0.02lnuc \quad (32)$$

The vectors expressed in equation 29 through to 31 do not obviously support the finance-growth theory because some of the coefficients such as gross fixed capital formation in the first CV, credit and the wedge in the second CV and then finally wedge and gross fixed capital formation in the third CV have the wrong signs. In addition to the just-identified system depicted in the above system of equations, the investment and credit were further restricted to $2^*a_2 + c_2 = 1$ so that they can have equal signs. This restriction produced an over-identified system depicted in matrix 32, which is easily accepted with the log likelihood ratio (LR) statistic for testing these restrictions to 0.22132, with p -value of 0.638 giving rising to a preferred model of the long-run of finance-growth nexus of South Africa.

$$\beta_s = \begin{pmatrix} & cv_1 & cv_2 & cv_3 \\ lnrgdpc & 1 & -.66 & -1.06 \\ & & (0.06) & (0.04) \\ lngfcf & -.27 & 1 & -1.54 \\ & (0.07) & & (0.15) \\ lnpsy & 1.72 & -.74 & 1 \\ & (0.06) & (0.04) & \\ lnwedge & 0 & -.27 & -.42 \\ & (none) & (0.06) & (0.08) \\ lnint & 0.08 & 0 & 0 \\ & (0.02) & (none) & (none) \\ lnopenk & 0 & -.11 & 0 \\ & (none) & (0.01) & (none) \\ lnuc & 0.16 & 0 & 0.02 \\ & (0.04) & (none) & (0.02) \end{pmatrix} \quad (33)$$

Once more we reproduce the results from matrix (33) in the usual way as follows:

$$lnrgdpc = 0.267lngfcf + 1.72lnpsy - 0.084lnint - 0.17lnuc \quad (34)$$

$$lngfcf = 0.66rgdpc + 0.71lnpsy + 0.27lnwedge + 0.11lnopenk \quad (35)$$

$$lnpsy = 1.06lnrgdpc + 1.53lngfcf + 0.42lnwedge - 0.02lnuc \quad (36)$$

From the above restrictions three links have been particularly emphasised in the analysis of long-run dynamics: the relationship between real GDP per capita and financial development and vice versa. And the indirect relationship finance and growth via gross fixed capital formation. The statistical analysis described in the body of this section shows that in the long-run real GDP responds positively to the share of real investment and credit to the private sector by the commercial banks (see cv_1 in matrix 33). In the cv_2 results seem to suggest that investment share responds positively to the real per capita income and financial development performance proxied by credit (see cv_2) while in the last cv_3 we have credit responding positively to real per capita income and gross fixed capital formation.

With respect to the cv_2 and cv_3 the signs of $lnwedge$ are counter intuitive. This result can be interpreted as follows: if the $lnwedge$ rate is increasing, then the $lngfcf$ and $lnpsy$ are picking up. This result is hard to explain in that the increase in $lnwedge$ means the drop in effectiveness

of banks to raise investment and credit. It is difficult to imagine how such developments can speed up the economic growth. One explanation for the result obtained in equation 34 and 36 regarding the sign of the wedge is that it could be used as proof for the theories explaining the negative relationship between financial sector development and economic growth.

Another possibility to explain this result is connected with the high costs of developing the financial sector system. The observed country was isolated from the rest of the world for quite some time. Thus if the wedge between the loan and deposit rate (operating margin) is low, due say to competition then it is not possible to finance substantial investments from the cash-flow. This may result in underdevelopment of the financial and this may lead to low growth rate of the economy due to low investments.

This result also raises the argument for the possibility of existing banks in South Africa charging monopoly interest rates because of the entry barriers of additional banks under the high growth of loan demand. To capture this effect we look at the plots of the wedge and credit over time. We find that the development of these two indicators are striking, and leads us to argue that banks did not raise the wedge when the loan demand was rising. Thus, the proposition of temporary monopoly profits does not seem to hold. Based on the above discussion and results we proceed to our next step which is constructing of the VECM.

5.6.2 The Vector Error Correction Model for RSA

Referring to the results in Table 30 the $ect1(-1)$, $ect2(-2)$ and $ect3(-1)$ depict the first, second and third co-integration vectors, respectively. The results of the temporal Granger causality test on this VECM are reported in (Table 30: Granger-Causality Tests on VECM). Concerning the long-run causality, the t -statistics for the ECT show that $ect1(-1)$ is statistically significant in the $lnrgdpc$ equation. The same is the case in the $lngfcf$ equation where $ect2(-2)$ is statistically significant. However, in the $lnpvy$ equation $ect3(-1)$ was found not to be statistically significant.

Table 30: Granger-Causality Tests on VECM for South Africa

		Full Model	
Sources of causation	$\Delta rgdpc$	$\Delta \ln gfcf$	$\Delta \ln pvy$
Short-run			
$\Delta \ln rgdpc$	-	CHSQ(1) 4.78(0.03)	CHSQ(1) 0.11(0.74)
$\Delta \ln gfcf$	CHSQ(1) 0.17(0.68)	-	CHSQ(1) 0.02(0.88)
$\Delta \ln pvy$	CHSQ(1) 4.39(0.04)	CHSQ(1) 0.34(0.56)	-
$\Delta \ln wedge$	CHSQ(1) 1.58(0.21)	CHSQ(1) 9.86(0.002)	CHSQ(1) 1.22(0.27)
Long-run ECT			
$ECM1(-1)$	-1.88 (-0.02)	-1.76 (-0.04)	1.55 (0.06)
$ECM2(-1)$	0.36 (0.10)	-2.30 (-1.30)	0.70 (0.61)
$ECM2(-1)$	-0.54 ^a (-0.09)	1.55 (0.55)	-0.73 (-0.39)

In the case of short-run estimates, figures in parentheses are the coefficient terms, while for the error terms the terms in parentheses are p-values.

These results would imply that a long-run causal relationship running from $\ln pvy$ to $\ln rgdpc$ exists, although not in the opposite direction, that is, from $\ln rgdpc$ to $\ln pvy$ (as the error correction term is not statistically significant in the third long-run equation). In the investment equation the results show that there is a long run causality running from $\ln rgdpc$, $\ln pvy$ and $\ln wedge$ to $\ln gfcf$. Our results therefore do not lend support to the claims that $\ln rgdpc$ causes $\ln pvy$. Conversely, our long-run results seem to support the supply-leading hypothesis that financial development via credit cause real per capita income. The long-run causal results also seem to support the existence of the indirect causal relation running from $\ln wedge$ via $\ln gfcf$ to real per capita income. The intuition behind this indirect causal relation is that South Africa experienced the repression of the financial sector system which may have contributed to the government controlling the interest rates more especially during the pre 1994 era.

With regards to the short-run causality the χ^2 -test of the lags of the differentiated variables show that a causal relationship running from $\ln pvy$ to $\ln rgdpc$ exists. We also found evidence of a

short-run influence of $lnrgdpc$ and $lnwedge$ on the $lngfcf$. Finally, a unidirectional Granger causality between financial development (credit) and growth in the short-run is found. The above results seem to confirm the supply leading hypothesis unearthed in the long-run dynamic. With regard to policy implications, we suggest that South Africa continues with the reforms on the financial sector system. It is hoped that this will not only bring about efficiency in the system but sustain the growth of the economy too.

5.7 Zambia

Last but not least we take a look at the empirical results for Zambia. For the selection of the order of the VAR tests, both the AIC and SBC criteria selected 3 and 1 as the order of the VAR respectively. Due to reasons alluded earlier in this chapter, we chose the VAR of order 2. Diagnostic tests (the LR test) for possible serial correlation in the residuals of the individual equations suggest that serial correlation is not a statistically significant problem. Co-integration results for finance and growth using model (37) for the order of the VAR (2), together with their associated 90% and 95% critical values are reported in Annexure A (Table (38): Testing for lag order in a VAR – Zambia).

In carrying out the analysis on the relationship between finance and growth, it must be pointed out that the analysis of the causal effect between finance and growth entails first testing the model without including the dummies. Using this first scenario, the results failed to establish any evocative co-integration relationship between finance and growth model. Against this no further analysis were attempted using this model. Therefore, the results reported under this test are those which include the two dummies (i.e. $dum75$ and $dum92$). In summary the system of equation of the VAR with lag of order 2 was treated as data congruent and consequently we proceed with the rest of our analysis based on the VAR of order 2.

Given a well specified VAR(2), the next step is to determine the rank of Π , i.e. determine the number of the co-integrating vectors. The Johansen procedure was once again applied in this case to test the finance-growth relationship hypothesis and the model was defined as:

$$\Delta x_t = \delta + \sum_{t=1}^{\rho+1} \Gamma_i \Delta x_{t-1} + \Pi x_{t-\rho} + \Psi D_t + \varepsilon_t \quad (37)$$

where once again $x_t = \lnrgdpc, lngfcf, lnpyv, lnwedge, lnuc, lnint, lnopenk$, Γ and Π representing short- and long-run coefficients and δ constant term. Furthermore, as the case was for Kenya and South Africa, the number of long-run relations (r) for Zambia also depends on the eigenvalues, trace of the matrix corresponding to equation 37 and indeed the a priori expectation. Using the Johansen ML technique for estimating the coefficients in the matrix (Johnston & DiNardo, 1997) and testing for r (Patterson, 2000) we note the following in the case of Zambia's model. The results tabulated in Table 31 show that both the Maximum eigenvalue λ_{max} and the Trace statistics λ_{trace} suggest $r = 2$.

Table 31: Johansen estimates – Zambia

Null	Alternative	Statistic	95% CV	90% CV
Co-integration LR test based on maximal Eigenvalue statistics				
$r = 0$	$r = 1$	67.1259	49.3200	46.5400
$r \leq 1$	$r = 2$	49.7522	43.6100	40.7600
$r \leq 2$	$r = 3$	30.6303	37.8600	35.0400
$r \leq 3$	$r = 4$	18.5835	31.7900	29.1300
$r \leq 4$	$r = 5$	15.0456	25.4200	23.1000
Cointegration LR test based on trace statistic				
$r = 0$	$r = 1$	198.0231	147.2700	141.8200
$r \leq 1$	$r = 2$	130.8972	115.8500	110.6000
$r \leq 2$	$r = 3$	81.1450	87.1700	82.8800
$r \leq 3$	$r = 4$	50.5147	63.0000	59.1600
$r \leq 4$	$r = 5$	31.9311	42.3400	39.3400

Order of the VAR=2. List of CVs: \lnrgdpc , $lngfcf$, $lnpyv$, $lnwedge$, $lnuc$, $lnint$, $lnopenk$, $Dum75$ and $Dum92$.

Although maximum eigenvalue statistic and the trace test are consistent in this model our theoretical prior is that there are 3 long-run relationships (that is direct and indirect causal relation) and this exerted a bias in favour of $r = 3$. Based on $r = 3$ we proceeded with the identification of the three long-run *cvs*.

5.7.1 Identification of Long-Run Model

Identifying the long-run structure basically involves testing hypothesis of financial growth nexus in the form of direct and indirect relationship as indicated above. Thus, normalisation restrictions were imposed on three vectors involving \lnrgdpc in *cv1*, $lngfcf$ in *cv2* and $lnpyv$ in *cv3*. In addition to these restrictions six addition zero restrictions were made. The outcome is the just-identified system depicted below.

$$\ln r g d p c = 0.31 \ln g f c f + 1.67 \ln p v y - 0.02 \ln i n t + 0.84 \ln o p e n k \quad (38)$$

$$\ln g f c f = 3.88 \ln r g d p c + 1.88 \ln p v y + 0.35 \ln u c + 1.55 \ln o p e n k \quad (39)$$

$$\ln p v y = -0.75 \ln r g d p c + 0.13 \ln g f c f + 0.14 \ln w e d g e - 0.24 \ln o p e n k \quad (40)$$

The empirical results in the above system of equations show that a direct interpretation of the estimates is not straightforward. When examining the unrestricted co-integrating vectors we notice immediately how different the estimated vectors are from the theoretical underpinnings of finance and growth nexus. For instance we see that signs of the coefficients of variables in many cases different (see $\ln u c$ in $cv2$ and also $\ln r g d p c$, $\ln w e d g e$ and $\ln o p e n k$ in $cv3$).

Based on this unsatisfactory result, we then proceeded to test the finance-growth nexus hypotheses using the above just-identified model as a basic model by imposing over-identifying restrictions. Since we expect the long-run relations to include real per capita income to have equal coefficient we therefore restricted these variables to have equal coefficients. These restrictions produced the over-identified system in the co-integrating vector of matrix (41), which was easily accepted with a $CHSQ(2) = 5.2110$ [.074]. This in essence gave rise to the preferred model of long-run relationship between financial development and economic growth of Zambia.

$$\beta_s = \begin{pmatrix} & cv_1 & cv_2 & cv_3 \\ \ln r g d p c & 1 & -.66 & -.06 \\ & & (0.19) & (0.19) \\ \ln g f c f & -.15 & 1 & -.21 \\ & & (0.16) & (0.10) \\ \ln p v y & 1.14 & -1.13 & 1 \\ & & (0.21) & (0.38) \\ \ln w e d g e & 0 & 0 & 0.15 \\ & & (none) & (none) & (0.03) \\ \ln u c & 0 & 0.17 & 0 \\ & & (none) & (0.07) & (none) \\ \ln i n t & 0.01 & 0 & 0 \\ & & (0.002) & (none) & (none) \\ \ln u c & -0.75 & -1.65 & 0.35 \\ & & (0.16) & (0.37) & (0.11) \end{pmatrix} \quad (41)$$

Consequently, the long-run co-integrating relationship involving direct and indirect causal relationships between finance and growth is reproduced in the usual equation form as follows:

$$\ln rgdpc = 0.15 \ln gfcf + 1.14 \ln pvy - 0.01 \ln int + 0.75 \ln openk \quad (42)$$

$$\ln gfcf = 0.66 \ln rgdpc + 1.13 \ln pvy - 0.17 \ln uc + 1.65 \ln openk \quad (43)$$

$$\ln pvy = 0.66 \ln rgdpc + 0.21 \ln gfcf - 0.15 \ln wedge - 0.76 \ln openk \quad (44)$$

The results reported above are striking, and show that in the first co-integrating vector (*cv1*) *ln rgdpc* is positively determined by *ln pvy* with the coefficient 1.14, which is significant at the one percent level. Importantly, *ln gfcf*, *ln int* and *ln openk* also appear to affect *ln rgdpc* with coefficients of 0.15, -0.01 and 0.75 respectively which are significant at the five percent level. These results appeal to yield results that are supported by the theory. For instance, the first estimate in the co-integrating vector (*cv1*) supports the endogenous growth view that gross fixed capital formation drives long-run economic growth. Similarly the negative effect of interest rates on real per capita income is in agreement with the traditional view of a long-run positive link between growth and capital accumulation and a negative long-run link between accumulation and cost of capital (see Mishkin, 1981 and Romer, 1990). The second co-integrating vector (*cv2*) shows that *ln rgdpc*, *ln pvy* and *ln openk* all have positive coefficients which are significant at the one percent level.

The results from the *cv3* seem to give results which are partially consistent with theory. The reason for this lies in the fact that while *ln rgdpc*, *ln gfcf* and *ln wedge* all are statistically significant and have correct signs, the same can not to be said to be the case with respect to *ln openk* which though was found to be significant had a wrong sign. One possible explanation for this counter intuitive result could be the failure by policy makers to stabilising the economy before opening it up to the outside competitors.

5.7.2 The Vector Error Correction Model

Conditional on the above long-run estimates, results for the vector error correction model in which both the short-run and long-run dynamics are computed are reported in Table 32 below.

Table 32: Granger-Causality Tests on VECM for Zambia

Sources of causation	$\Delta \ln rgdpc$	Full Model $\Delta \ln gfcf$	$\Delta \ln pvy$
$\Delta \ln rgdpc$		CHSQ(1) 0.19E-4(0.99)	CHSQ(1) 0.43(0.51)
$\Delta \ln gfcf$	CHSQ(1) 3.52(0.06)	-	CHSQ(1) .83(0.36)
$\Delta \ln pvy$	CHSQ(1) 7.84(0.00)	CHSQ(1) 0.79(0.37)	-
$\Delta \ln wedge$	CHSQ(1) 3.40(0.07)	CHSQ(1) 1.68E-3(0.99)	CHSQ(1) 0.04(0.84)
Long-run ECT			
$ECM1(-1)$	-2.68 (-0.13)	1.69 (0.51)	0.61 (0.08)
$ECM2(-1)$	0.21 (-0.00)	-3.77 (-0.34)	-1.94 (-0.08)
$ECM3(-1)$	-4.78 (-0.53)	-0.19 (-0.12)	0.07 (0.02)

In the case of short-run estimates, the figures in parentheses are the coefficients while for the ECM the terms in parentheses are p -values.

Having discovered long run relationships via the co-integrated vector method, vector error-correction techniques are applied. The lagged residuals from the co-integrating regression with the appropriate number of lags are included in the Granger-causality test structure. The lag length structure depends on the restricted error-correction models. For both Models, the restricted error-correction specifications pass a series of diagnostic tests, including serial correlation based on the inspection of Lagrange multiplier.

Results in Table 32 also report the findings for the endogeneity of all variables, based on the error-correction equations. From the three co-integrating vectors established above, estimates of the parameters show that the error-correction term measuring the long-run disequilibrium is significant in two out of the three equations (i.e. $ect1(-1) = -0.1$, $ect2(-0.34)$ and $ect3(-1) = 0.02$, which was found not to be statistically significant. Thus, concerning the long-run causality, the t -statistic appears to be significant in only the first and second co-integrating vectors. However in the $\ln pvy$ vector equation none appear to be significant. This implies that all the variables in the $cv1$ and $cv2$ have a tendency to restore equilibrium and take the burden

of any shock to the system. In this case the t -tests for the error-correction terms, at the 1% level of significance, indicate that $lnrgdpc$ is granger caused by $lnpvpy$.

These results would imply that a long-run causal relationship running from $lnpvpy$ to $lnrgdpc$ exists, although not in the opposite direction, that is, from $lnrgdpc$ to $lnpvpy$ (as $lnrgdpc$ is not significant in the long-run equation). Our results therefore do not give support to the claims that in the long run a bi-directional causality does exist between finance and growth in Zambia. Conversely, private credit as a proxy of financial development seems to cause and precede real per capita income.

Regarding the short-run dynamics (Granger-causality in the strict sense) of $cv1$, the Wald-tests suggest that $lnrgdpc$ is affected by changes in $lngfcf$, $lnpvpy$, and $lnwedge$. This finding is based on the significance of the p -values of these variables at 10, 5 and 10 percent respectively. The short-run dynamics in $cv2$ and $cv3$ indicate that there is no causality existing between variables of interest. This means that only a unidirectional relationship exists from private credit and wedge to real per capita income. This of course is in addition to the causal inference running from gross fixed capital formation to growth as mentioned before.

To complete the analysis of the causal relationship it is useful to compare the VECM results with those generated through Toda-Yamamoto method. The argument for this as mentioned in chapter 4 is to check for the robustness of the results. Hence the next section is cantered on the discussion of causality relationship between finance and growth in levels using the Toda and Yamamoto framework. It must be pointed out that this only involves the long-run dynamics.

5.8. Toda-Yamamoto Level VAR results

In this section analysis of results from the point of view of Toda and Yamamoto method is employed. The econometric estimations from this section are intended to offer some robust checks to our earlier results obtained under the VECM modelling in chapter 5. Thus, the analysis of these results will show whether our earlier results are robust or not. The empirical estimations are based on the hypothesised relationships constructed in the theoretical framework. They indicate the type of hypothetical relation the financial development via credit and efficiency of the banking industry has with the economic activities in three selected countries namely Kenya, South Africa and Zambia. We thus begin the analysis with Kenya, followed by South Africa and then lastly Zambia.

5.8.1 Brief Recap of Toda-Yamamoto Method

These tests are based on null hypotheses formulated as zero restrictions on the coefficients of the lags of a subset of the variables. However, such tests are grounded in asymptotic theory; yet, it must be borne in mind that asymptotic theory is only valid for stationary variables, thus if a series is known to be non-stationary, $I(1)$, then such inferences can only be made if the VAR is estimated in first differences, and therefore stationary. This causes problems because the unit root results based on the tests of the null hypothesis of stationarity have low power against the alternative hypothesis of trend stationarity. Similarly, the tests for co-integrating rank in Johansen's tests are sensitive to the values of trend and constant terms in finite samples and thus not very reliable for typical time series sample sizes. In other words, it is possible that incorrect inferences could be made about causality simply due to the sensitivity of stationarity or co-integration tests.

In this section the methodology proposed by Toda and Yamamoto (1995) is applied in testing for causality in the Finance-Growth relationship. As stated earlier on in chapter 4, Toda and Yamamoto avoid the problems outlined above by ignoring any possible non-stationarity or co-integration between series when testing for causality, and fitting a standard VAR in the levels of the variables (rather than first differences, as is the case with the Granger and Sims causality tests), thereby minimising the risks associated with possibly wrongly identifying the orders of integration of the series, or the presence of co-integration, and minimises the distortion of the tests' sizes as a result of pre-testing (Toda-Yamamoto, 1995; Giles, 1997).

In this case all one needs to do is to determine the maximal order of integration d_{max} (where d_{max} is the maximal order of integration suspected to occur in the system), which we expect to occur in the model and construct a VAR in their levels with a total of $(k + d_{max})$ lags. Toda and Yamamoto point out that, for $d = 1$, the lag selection procedure is always valid, at least asymptotically, since $k \geq 1 = d$. If $d = 2$, then the procedure is valid unless $k = 1$. Moreover, according to Toda and Yamamoto, the MWald statistic is valid regardless of whether a series is an $I(0)$, $I(1)$ or $I(2)$, non co-integrated or co-integrated of an arbitrary order. Based on this we move to the estimation of the causal inference in levels.

5.8.2 Estimation Results

The results of tests of restrictions from a VAR estimated by the procedure prescribed by Toda and Yamamoto (1995) are reported in Table 33, 34 and 35. The important point to note is that

these results do not include short-run dynamics. Based on this, one must bear in mind that when we do check for the robustness of our results, this will be with those results obtained using the error-correction models and mainly those pertaining to long-run causal dynamics. Below in Table 33, Table 34, and Table 35 we report the results based on the Toda and Yamamoto method.

5.8.3 Kenya

Starting with Kenya, the results in Table 33 seem to support the bi-direction hypothesis between credit to the private sector and economic growth. As we can see from these results the null hypothesis of Granger no-causality can be strongly rejected at the 99 percent confidence level in the case of credit and growth with p -values of 0.016 in $cv1$. Similarly, we reject the null hypothesis of Granger no causality in $cv3$ where the p -value of MWald statistic for real per capita income was found to be 0.022. With regard to the rest of the variables we failed to reject the null hypothesis of Granger no-causality.

**Table 33: Results of long-run causality test
based on Toda-Yamamoto Augmented lags Methods for Kenya.**

Variables	Order of unaugmented VAR Model ^(a)	Source of causation			
		lnRGDPC	lnGFCF	lnPVY	lnWEDGE
lnRGDPC	2	-	$\chi^2(1)=0.31$ [0.58]	$\chi^2(1)=5.76$ [0.016]	$\chi^2(1)=0.07$ [0.79]
lnGFCF	2	$\chi^2(1)=0.34$ [0.56]	-	$\chi^2(1)=1.14$ [0.27]	$\chi^2(1)=0.01$ [0.93]
lnPVY	2	$\chi^2(1)=5.21$ [0.022]	$\chi^2(1)=0.08$ [0.78]	-	$\chi^2(1)=1.58$ [0.21]
lnWEDGE	2	$\chi^2(1)=1.09$ [0.30]	$\chi^2(1)=0.70$ [0.40]	$\chi^2(1)=0.00$ [0.95]	-

Optimal lag length is determined by AIC and SC. VAR order = $k+d_{max}$ where k is the lag length used in the system and d_{max} is the maximum order of integration in the system. Here, it is $I(1)$ and $k=1$.

Results obtained under this method though shows only two causal relationships between finance and growth using Toda and Yamamoto; the striking point about these results is that they support

VECM results in that they too support both the demanding-following and supply-leading hypothesis.

5.8.4 South Africa

The results in Table 34 for South Africa are different from those of Kenya. With regard to *cv1* we notice that in all the three explanatory variables we failed to reject the null hypotheses of Granger no-causality. This implies that there is causal relation running from *lngfcf*, *lnpvv* and *lnwedge* to *lnrgdpc*. Results also show that in *cv2* the null hypothesis for Granger no causality for *lnrgdpc* and *lnpvv* could not be rejected. These results would therefore imply that causality runs from *lnrgdpc* and *lnpvv* to *lngfcf*. Furthermore, these results seem to indicate the existence of the indirect causal relationship in the economy (that is private credit to growth via investment). In summary results obtained here support those found in VECM in that both models appear to lend support to the supply-leading and the indirect causal relationship found in the long-run of VECM.

**Table 34: Results of long-run causality test
based on Toda-Yamamoto Augmented lags Methods for S. Africa.**

Variables	Order of unaugmented VAR model	Source of causation			
		lnRGDPC	lnGFCF	lnPVY	lnWEDGE
lnRGDPC	3	-	$\chi^2(3)=13.55$ [0.004]	$\chi^2(3)=12.16$ [0.007]	$\chi^2(3)=9.59$ [0.022]
lnGFCF	3	$\chi^2(3)=11.3$ 2 [0.010]	-	$\chi^2(3)=17.68$ [0.001]	$\chi^2(3)=1.58$ [0.663]
lnPVY	3	$\chi^2(3)=0.14$ [0.143]	$\chi^2(3)=4.33$ [0.228]	-	$\chi^2(3)=0.62$ [0.892]
lnWEDGE	3	$\chi^2(3)=0.28$ [0.963]	$\chi^2(3)=1.19$ [0.756]	$\chi^2(3)=3.62$ [0.306]	-

Optimal lag length is determined by AIC and SC. VAR order = $k+d_{max}$ where k is the lag length used in the system and d_{max} is the maximum order of integration in the system. Here, it is $I(1)$ and $k=2$.

5.8.5 Zambia

Lastly, in the case of Zambia the results tabulated in Table 35 indicate that the null hypothesis for Granger no-causality from *lngfcf* to *lnrgdpc*, and *lnwedge* to *lnrgdpc* cannot be rejected at 99 percent level (with *p*-values of 0.04, and 0.047 for the MWald statistic respectively). In the same vein we found causality running from credit to gross fixed capital formation. This means that in the long-run, Zambia's economy experience two types causation that is direct and indirect causality. This finding is based on the empirical results which point to the following: first, unidirectional causal relationship running from *lngfcf* and *lnwedge* to *lnrgdpc*, and secondly causal relation running from *lnpv* to *lnrgdpc* via *lngfcf*.

**Table 35: Results of long-run causality test
based on Toda-Yamamoto Augmented lags Methods for Zambia.**

Variables	Order of VAR Model	Source of causation			
		lnRGDPC	lnGFCF	lnPVY	lnWEDGE
lnRGDPC	2	-	$\chi^2(1)=4.23$ [0.040]	$\chi^2(1)=0.37$ [0.543]	$\chi^2(1)=12.17$ [0.000]
lnGFCF	2	$\chi^2(1)=0.09$ [0.769]	-	$\chi^2(1)=3.94$ [0.047]	$\chi^2(1)=0.04$ [0.836]
lnPVY	2	$\chi^2(1)=0.06$ [0.809]	$\chi^2(1)=0.47$ [0.492]	-	$\chi^2(1)=1.19$ [0.275]
lnWEDGE	2	$\chi^2(1)=0.02$ [0.894]	$\chi^2(1)=0.82$ [0.366]	$\chi^2(1)=0.05$ [0.830]	-

Optimal lag length is determined by AIC and SC. VAR order = $k+d_{max}$ where k is the lag length used in the system and d_{max} is the maximum order of integration in the system. Here, it is $I(1)$ and $k=1$.

5.8.6 Constancy of Co-Integration Space

Hansen (1992) cautions that estimated parameters of a time series may vary over time. Parameter tests are thus important, since unstable parameters can result in model misspecification, which have potential to bias the results.

These tests as described by Pesaran and Pesaran (1997) are based on recursive 1-step ahead residuals, that is the equation is estimated over the sample 1 to $(k + 1)$ and used to predict period in $(k + 2)$. In this case the error from this prediction is the first recursive residual. The

next step is to roll forward the sample end date and prediction period by 1 and this continues until all N observations are used in estimation. The caveat in this test is that if dummy variables are included into the UVAR it will not be feasible to look at recursive residuals because the dummy variable(s) will take the value 0 throughout some sample periods. Thus, this problem can only be avoided if the parameters attached to the dummies are fixed at their estimated values in the full sample. To test for stability we use the Hansen (1992) and Pesaran and Pesaran (1997) tests. According to Pesaran and Pesaran (1997), the short-run dynamics are essential in testing for stability of long-run coefficients. The Pesaran and Pesaran (1997) test amounts to estimating the error-correction models like those in section 5.7.

Here all variables are as previously defined and error-correction term is calculated from the long-run co-integrating vectors. Once the models have been estimated, Pesaran and Pesaran (1997) suggest applying the cumulative sum of recursive residuals (CUSUM) and the (CUSUMSQ) test proposed by Brown *et al.* (1975) to assess the parameter constancy.

In this thesis, the stability of all the three models employed in this analysis was estimated by ordinary least squares method and the residuals were subjected to the CUSUM and CUSUMSQ test. Figure 28 to Figure 33 shows the plots of the CUSUMSQ statistics for the three models respectively.

Figure 28: CUSUMSQ Results for Kenya

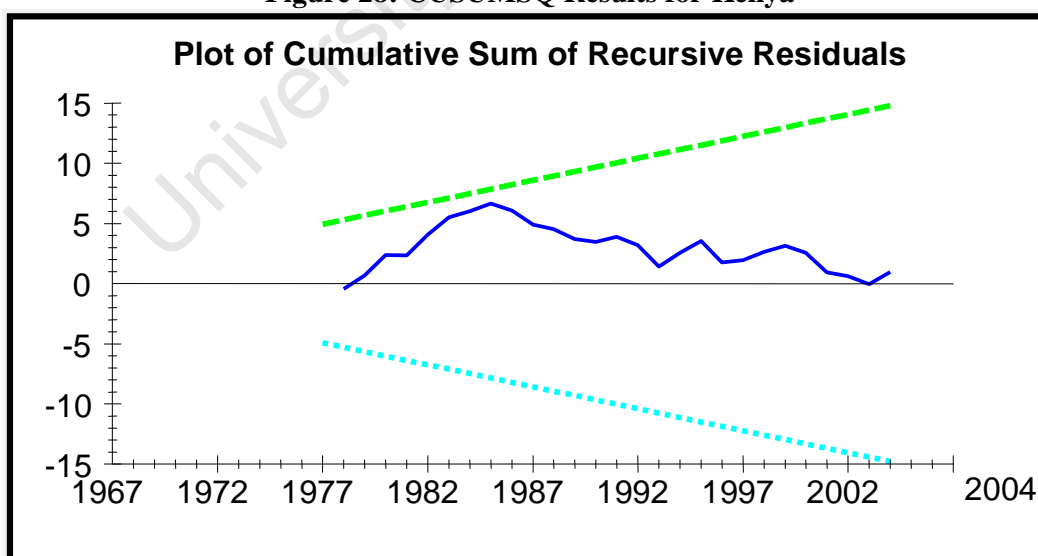


Figure 29: CUSUMSQ Results for Kenya

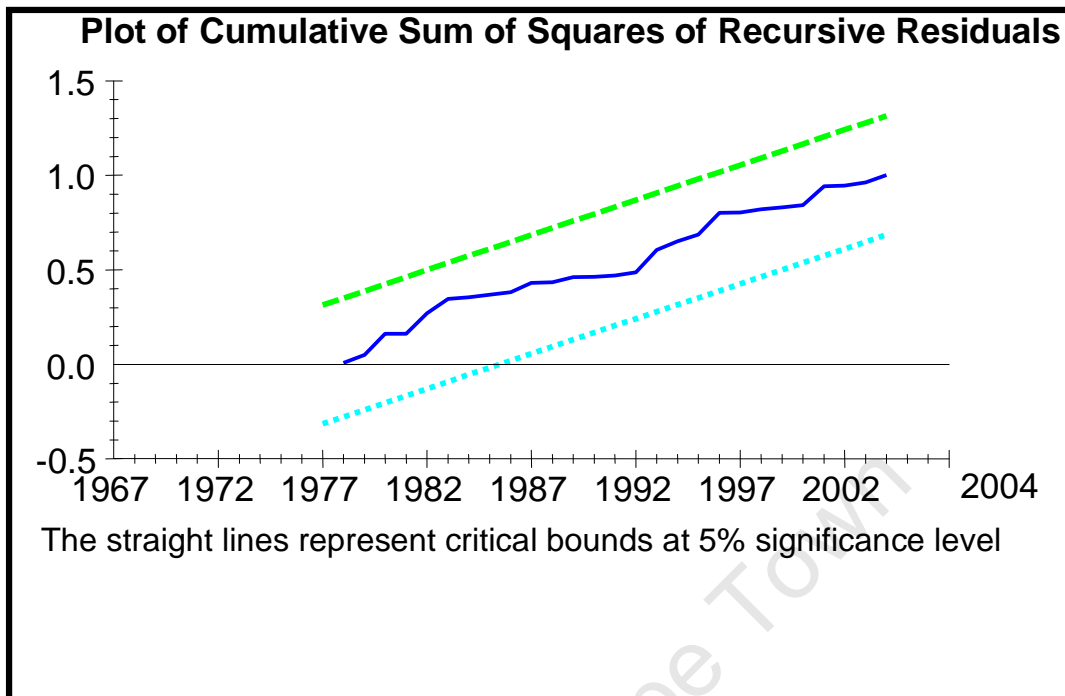


Figure 30: CUSUMSQ Results for South Africa

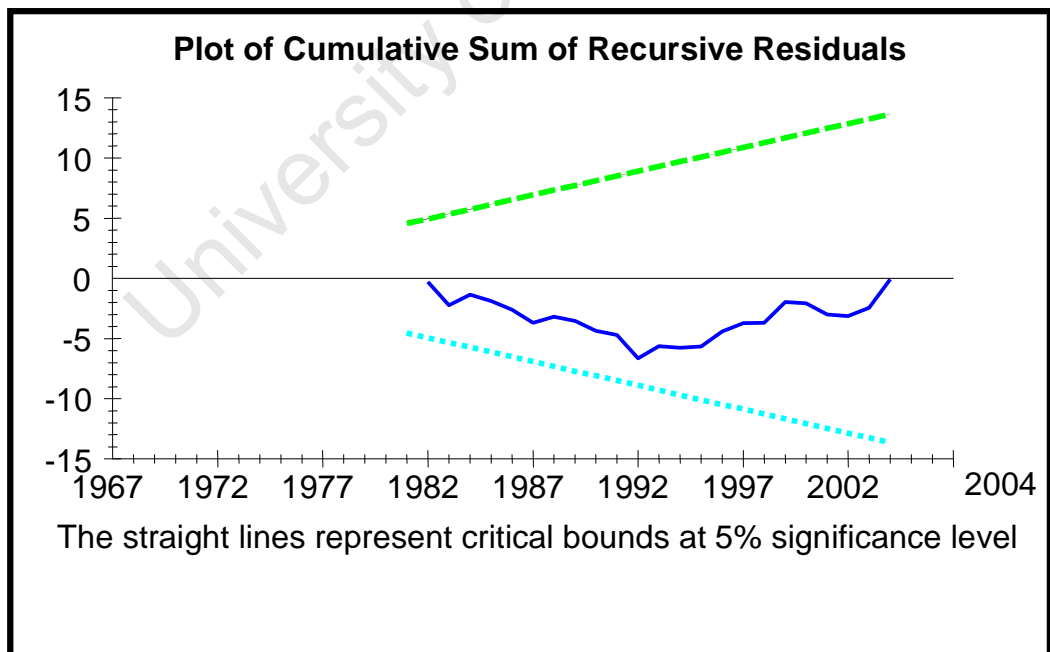


Figure 31: CUSUMSQ Results for South Africa

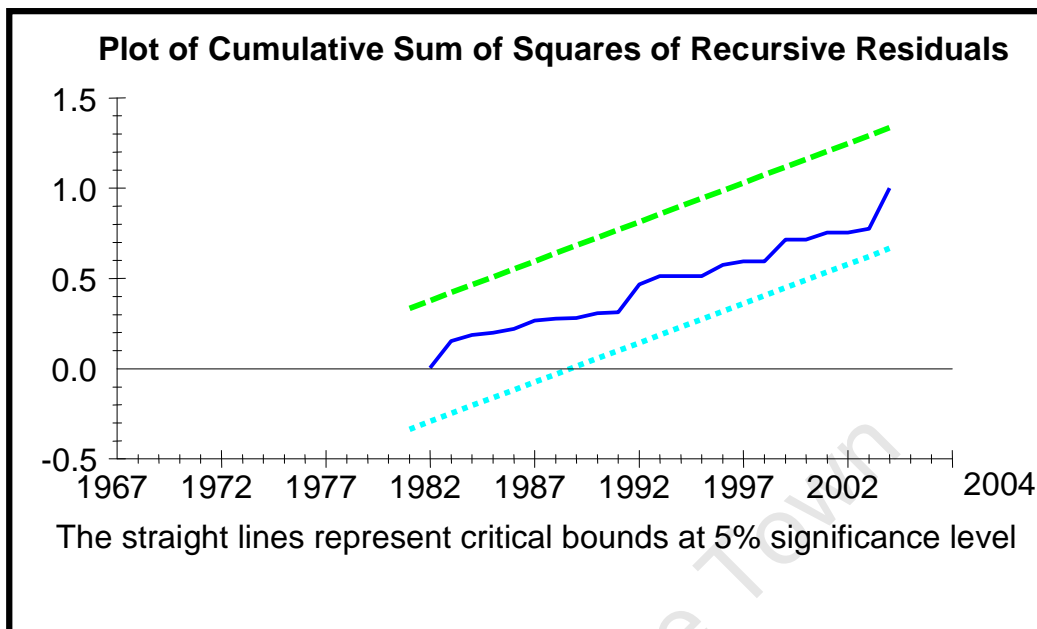


Figure 32: CUSUMSQ Results for Zambia

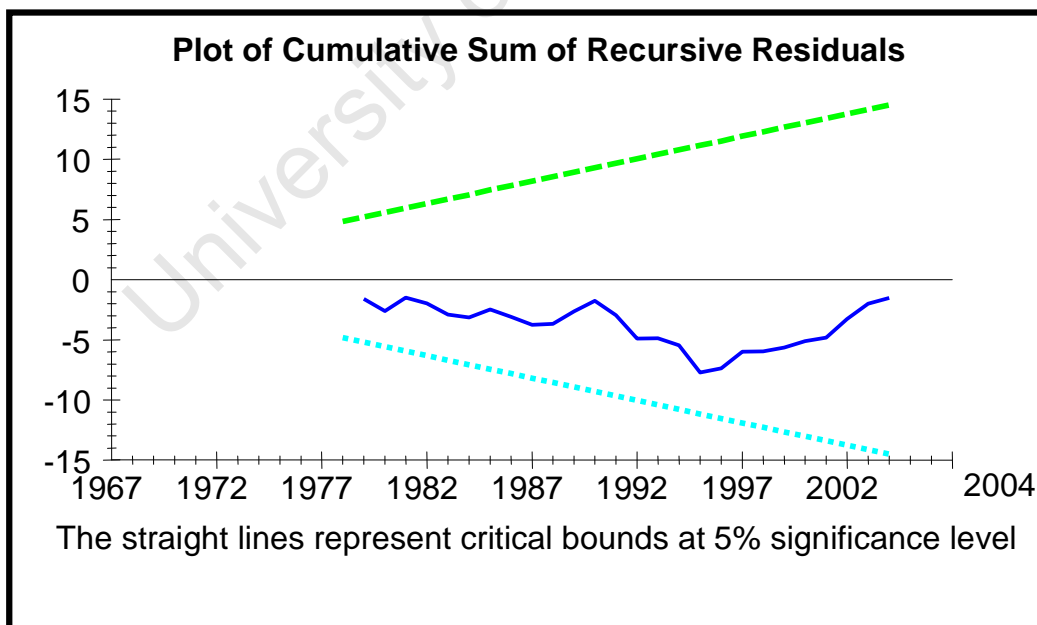
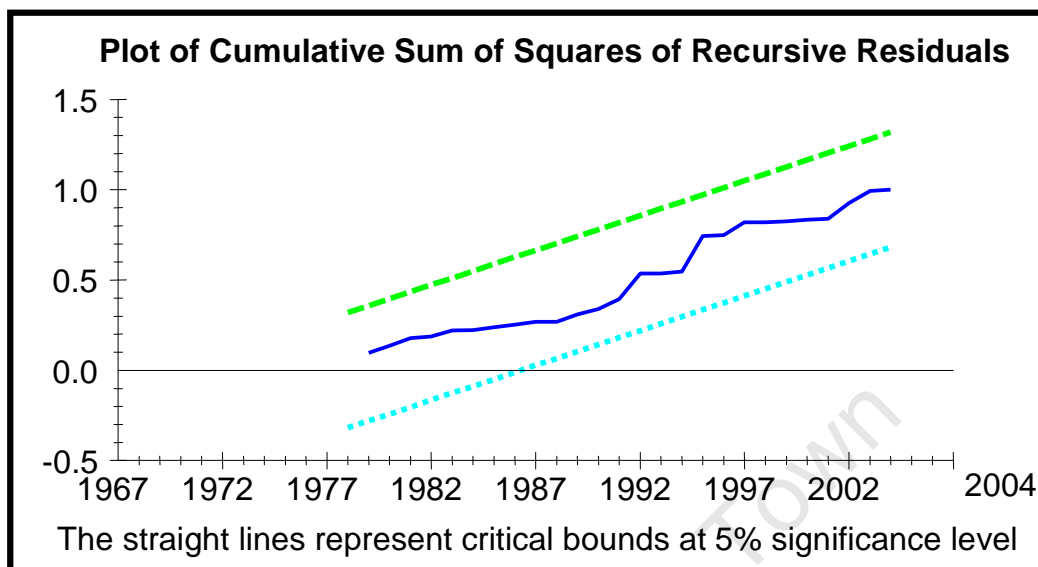


Figure 33: CUSUMSQ Results for Zambia



From the above six figures, the results indicate absence of instability in the coefficients as the plot of the CUSUM and CUSUMSQ statistics are confined within the 5% critical bounds of parameter stability. This indicates that the structure of the parameters have not diverged abnormally over the period of the analysis.

Chapter 6

Conclusion & Policy Implications

This chapter provides a summary, an overview and assessment of various conclusions reached at the close of each chapter of this thesis and recommends areas for possible further research. This study empirically investigated the causal relationship in the sub-Saharan countries. It focused on financial institutions and in particular financial institutions such as banks in the three countries namely, Kenya, South Africa and Zambia. The main issue of causality has four definitions which are commonly adopted in literature. Firstly, financial development and economic growth nexus are linked to the early theoretical model of Schumpeter on supply-leading. According to this theoretical model as argued in chapter 2, financial development is seen as the determinant of economic growth. In this view, the line of causation runs from financial sector to economic growth, where finance is one among many other growth inducing factors. Therefore, finance acts as a supply leading growth mechanism. Specifically, recent theoretical underpinnings give rationales for the assumption that well-functioning monetary, banking systems and capital markets may be vital ingredients for economic growth (see theoretical framework of the empirical studies outlined in chapter 2). The caveat to this line of thought is that arguments advanced to support this may vary. However, Schumpeterian authors as well as the Neo-Keynesians usually stress the ability of the banking system to create money and channel it into productive and innovative uses. Others claim that it is the information gathering and processing, which is accomplished by banks and capital markets that helps to improve the efficiency of the capital allocation.

Secondly, financial activity is taken to be the result of economic activity. Financial development is thus demand-driven. The argument which is advanced under this theory is that, as the growing economic activities requires more and more of capital, institutional raising and pooling of funds for fixed capital formation are created in response to their demand.

Thirdly, financial activity and economic growth are seen as not causally related. In this view, the observed correlation between them is said to be spurious. The implication of this result is that economies grow and so do the financial sector system. However, what is critical in this case is that the two follow their own line of logic.

Fourthly, some scholars see financial activity as an obstacle to economic growth. Thus, as in the previous case, the causation runs from financial development to economic growth, but the focus here lies on the potentially destabilising effects of financial crises.

The rest of this chapter is sub-divided into five sections. Section 2 extends the research into two different ways. First, it presents the summary of literature based on African countries including their empirical studies. This section also includes the theoretical framework covering most importantly the causality issue between finance and growth, followed by the various links through which finance affects growth. For instance, transmission channels, structure of the financial systems whether bank or market based. All this is summarised by the empirical studies which are sub-grouped according to: (1) whether they are based on cross-country with banking intermediary or time series with banking intermediary and (2) whether the study is cross-country with either financial intermediaries or time series with both financial intermediaries and security markets. Emphasis on all these studies is placed on the investigated link, method applied, variables used and indeed the major findings. Results on cross-country studies show consistency with regard to the positive link between finance and growth. On the other hand, time series studies on causality seem to show conflicting results in both developing countries as well as less developing countries.

Section 3 presents a summary of all three countries included in the study. The summary extends the study in three different directions. Firstly, it focuses on the macroeconomic performance of the economies. Secondly, the section discusses the experience of the reforms on the financial sector development. Reflecting on these two aims we now present the general conclusions drawn from these reviews.

Kenya

The financial sector reforms adopted by the government had varied effects on the development of the financial sector system. The repression policies instituted by the government which favoured the establishment of NBFIs led to more of these institutions being formed and less of the commercial banks. However, when the rules were levelled between them, the banking sector expanded due to mergers and take-overs. It was found that policies of the Kenyan government led to a situation where the banking sector system was not dominated by the foreign banks. Finally, the reforms that were instituted by the government of Kenya did not lead to financial disintermediation though the system was highly concentrated. In any case, the financial sector seems to have done better despite these negative connotations.

South Africa

Despite the financial repression policies implemented on the banking system, the private sector found a number of ways of how to better manage banks in order to spur growth. In view of this, the South African banking system managed to achieve some form of development despite the economy experiencing the downward trend. The market forces and indeed financial policies led to the amalgamation of the banks and the birth of ABSA and First Rand. The policies of the mid and late 1990s also led to the re-entry of foreign banks into the banking system. The notable banks which came back include Barclays bank which bought ABSA and Standard Chartered bank which bought Twenty20. At the same time the distinction between the commercial banks and merchant banks disappeared. The policies reforms of the 1990s also brought in a number of innovations in the banking system such as internet banking, cell phone banking and mushrooming of cash teller machines. Above all the banking contribution to the economic growth achieved remarkable results by 2004 when the sector contribution to GDP ranked first.

The similarity in the financial policies of South Africa to that of Kenya is that both countries implement policies which favoured the creation of local banks. This argument can also be extended to include Zambia where formation of local banks was encouraged by the government. Furthermore, unlike Kenya and Zambia, where foreign banks have long played a critical role, this situation was different in the case of the South African banking sector system which was mainly dominated by local players (i.e. ABSA, Standard, First Rand and Nedcor) fairly recently. Furthermore, despite the banking system being highly regulated, its performance has been good with the system appearing well managed to drive the growth of the economy.

Zambia: The financial sector in Zambia survived the initial financial policies implemented in the 1970s and 1980s. This limitation in the effects of financial repression has been linked to two issues. First the moderate inflation which was prevailing helped to mitigate this factor. Second, the main channel of resource allocation in Zambia during that period was not the banking system but the foreign exchange controls.

The negative effects on the banking system however started taking its effect in the late 1980s. This was attributed to high inflation rates which the economy experienced. The high inflation which went up to 180% led to a decline in financial development as real interest rates turned to be highly negative. The adoption of the policies was also negatively affected as there was too much government interference in the policy implanted and this resulted in policy reversal. This

trend was similar to that of Kenya although in the case of Zambia the effects of both policy reversals and policies implemented were worse on the financial sector.

In summary, the reforms instituted in Zambia have yielded mixed results with the reforms showing little effect on the development of the financial sector system. For instance, credit provided by the commercial banks to the private sector has been declining since reforms were implanted. Similarly, the wedge, i.e. the difference between deposit and lending rate, has remained high. Overall, the Zambian financial sector system seems to rank lowest among the three countries included in the study.

Section 4 is a summary discussion of the models used in this thesis. They include PSS ARDL, VECM and Toda and Yamamoto. These three methods were preferred because of their unique characteristics. For instance PSS ARDL method helped in pinning down the exact variables in the VECM needed in the normalisation. The VECM on the other hand helped with its special features to test the direction of causality in both short- and long-term dynamics. Last but not least Toda and Yamamoto, based on its simplicity and high power of prediction, was used to test for the robustness of the results.

Section 5 provided an extensive discussion of the properties of the time series data. Both univariate and multivariate models to analyse the degree of integration are presented. While the latter produced mixed results, the univariate unit-root tests backed the assumption that the data are difference-stationarity for all the time series, using the ADF test for stationarity. Consequently, the VECM appears to be the appropriate framework to analyze the long-run economic equilibrium relationships as well as the short-run adjustments of finance and growth.

In this section, the $I(1)$ analysis of the VECM was carried out using the Johansen procedure. Two rank tests as well as an analysis of the roots near the companion matrix came to the conclusion that each seven-variable VECM contains three co-integrating vectors which can be identified as long-run relationships of financial development and economic growth and their reverse relationship. Furthermore, the third co-integration was identified through the indirect relationship of finance-growth involving gross fixed capital formation. Zero restrictions were used to achieve this identification: for the growth vector, it was assumed that wedge is irrelevant whereas the credit vector was identified by restricting the long-run influence of interest rate to zero. Finally, the indirect influence involving investment or gross fixed capital formation entailed restricting openness in the case of South Africa and Kenya and interest rates for Zambia.

Then over-identifying restrictions were tested to see whether long-run predictions by economic models are supported by the data.

On the growth vector, it was tested whether the financial sector development via credit is significant and has the correct sign. The second vector tested whether gross fixed capital does have the positive impact on growth and the last vector tested the long-run relationship involving credit and growth. Whereas all the three hypotheses were accepted, the coefficient of the wedge for South Africa was found to be counter intuitive in that it had a wrong sign in both *cv2* and *cv3*. The other difference among the three countries with regard to long-run relation was that, openness variable in *cv3* for Zambia also had the incorrect sign.

Results for the supply-leading hypothesis between finance and growth turned out to be more homogeneous across countries and easy to model. The identification strategy discussed above yielded sensible results for the three countries whose long-run finance-growth nexus was found to be consistent as generally assumed in the literature. The same identification strategy produced slightly (but significantly) supply-leading long-run results when applied to the South Africa and Zambia. In the second vector, both growth and private credit were supported by the theory which postulates their positive relationships. The same was true in the third vector where, the positive long-run relation as argued in literature was found to exist between finance and growth and also between investment and private credit. Unfortunately, like said before we found the positive link between wedge and investment in the case of South Africa and also negative relationship between openness and private sector in the case of Zambia, an unsatisfying feature that did not disappear whatever over-identifying restriction was added to the models. Therefore the identifying restriction and the model specification itself were questioned and alternatives were searched for. Unfortunately no alternative identifying restriction could give us the correct signs for wedge and openness variables. Based on the different basic models, the set of over-identifying restrictions was tested in all three countries. Most importantly, a linear heterogeneity restriction on the coefficients of growth, finance and investment was tested to see whether growth is positively link to finance and vice versa. Also tested was the positive relationship between private credit and growth which was found to be consistent with the theory (Schumpeter, 1911). These findings with regard to long-run relation involving key variables were consistent in all the three cases involving Kenya, South Africa and Zambia with those two exceptions.

In the case of the main question of the thesis, (i.e. which way causality runs between finance and growth), the following general results were obtained. First, the supply-leading and demand-following were found to exist although the evidence varied across the three countries. For example, an unambiguous support for the supply-leading hypothesis was found to exist in the case of South Africa using both measures of financial intermediation (i.e. *lnpvvy* and *lnwedge*). This finding is supported by the test results found in VECM and complemented by those obtained using the method proposed by Toda-Yamamoto. Another important result from the VECM model is that of indirect causal relationship between *lnwedge* and *lnrgdpc* via *lngfcf*. The same can be said to be true when we look at the relationship between *lnpvvy* and *lnrgdpc* in Toda-Yamamoto model. We find in addition to the direct relation between *lnpvvy* and *lnrgdpc* an indirect relationship via gross fixed capital formation. The results for South Africa are supported by the findings of Chandana (2002) and the World Bank (1999), which explains that an indirect causal relationship exists between finance and growth in South Africa.

In the case of Kenya our results seem to support both the uni-directional and bi-directional causal relationship between finance and growth. For instance the long-run causal relationship running from *lnpvvy* to *lnrgdpc* is found to exist in VECM. This result is supported too by Toda-Yamamoto methodology. The point to note is that in addition to the results supporting the supply-leading hypothesis, demand-following hypothesis too is supported via the reverse causal inference. The results between *lnpvvy* and *lnrgdpc* also reveal the indirect causality relationship taking place via investment. The implication of the above results is that we have support for the existence of both the uni-direction and bi-direction causality in the economy of Kenya.

Finally, regarding Zambia, financial development was also found to be a necessary causal factor in the growth processes of the economy. In particular, evidence for the supply-leading hypothesis between *lnpvvy* and *lnrgdpc* took effect indirectly via *lngfcf*. However, when test causality was carried out between *lnwedge* and *lnrgdpc* results showed that the causality runs from finance to growth.

In view of the above results, it can be stated that the three countries namely Kenya, South Africa and Zambia yielded similar results that supported the hypothesis that causation in the long-run is in accordance with the supply-leading and demand-following hypothesis if we use the complexity (sophistication) of the financial sector to measure the degree of financial intermediation. Thus, expanding the size of the financial sector via financial credit and efficiency can trigger long-run economic benefits in all the three countries.

Furthermore, a somewhat different picture emerged from the results for all the three countries when we consider the short-run dynamics. In particular, the Kenyan data which suggested the demand-following as opposed to supply-leading which is common to both South African and Zambian cases. Over the short-run, our results imply the presence of uni-directional causality between the degree of financial development (as measured by the level of credit offered by banks to the private sector and wedge) and economic growth, giving credence to the supply-leading in two out of three cases and the demand-following propositions in only one case. Thus, in the short-run while financial development leads to economic growth in South Africa and Zambia, it's the economic growth which induces growth in financial development and vice versa in the case of Kenya.

In addition to the above results, the VECM and Toda and Yamamoto suggest at least two more important observations. First, the economic stimulus of more sophisticated and efficient financial markets in Kenya, South Africa and Zambia became noticeable when we consider the long-run relationship. Of course, such long lags in the beneficial effect of an efficient financial sector on economic growth carries with it the risk that policymakers in these countries may be deceived in believing that improving the operation and diversity of their financial markets has no real economic advantages. Yet, the empirical results in this thesis indicate that financial intermediation through both credit and wedge contributes to economic growth. The finding that such a favourable economic effect requires a somewhat long time to be felt implies that policies to promote efficient financial institutions in the two countries should be persistent over a somewhat prolonged period of time. The second observation pertains to the results being somewhat country-specific and varying across the particular proxy used to measure the degree of financial intermediation. This, however, should not be too surprising as these countries exhibit diverse economic environments, and the proxy variables used address different aspects of their financial maturity. Other studies (e.g. Demetriades & Hussein, 1996) have also reported results that are highly country specific with considerable variation across proxies of financial deepening.

Based on the results obtained under VECM and Toda Yamamoto, the countries differ as to the relevance of demand-following causal relation in both the VECM and Toda Yamamoto. Whereas the expected supply-leading causal relationship was found in all the three countries, demand-following causality was only found in the case of Kenya. The assumption of no causal influence based on demand-following was best supported by the South African and Zambian data. Interestingly, the results for South Africa and Zambia seem to be supported by the a prior

expectations of supply-leading hypothesis being the main driver in developing countries and note demand-following as the case was for Kenya. It must be noted at this stage that the result of demand-following for Kenya is not unique for this study alone as other studies have gotten similar results (see Agbetsiafa, 2003).

Finally, Kenya, South Africa and Zambia also differ as to the question in which variables are involved in the co-integrating vectors. However the scenario is different when the error correction mechanism is considered. The three VECMs all have in common the number of endogenous variables (4 out of the 6).

The discussion of the causal relationship between finance and growth is not yet complete. The indications given so far cannot replace the finding in the literature which point to the fact that causal relationship issue is not yet settled. This analysis should be carried out with the most parsimonious PVECM, i.e. after elimination of the insignificant short-run coefficients remaining in the system. A further increase in the time period, number of countries to be covered, number of coefficients as well as employing a thorough impulse-response analysis represents the natural extension of the analysis presented in section 6. Another extension consists of using these results for model-based forecasts, e.g. a simultaneous forecast of finance and growth for Kenya, South Africa and Zambia. Last but not least, it would be useful to see how sensitive the central finding of this thesis, the existence of three co-integrating vectors, identifiable as growth, finance and gross fixed capital formation, are with respect to the choice of variables. For instance, it would be interesting to see whether leaving out the private credit and wedge (the typical financial variable) would reduce the rank or maintain at three.

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Annexure: A

Table (36): Testing for lag order in a VAR – Kenya

Test Statistics and Choice Criteria for Selecting the Order of the VAR Model Based on 36 observations from 1969 to 2004. Order of VAR = 4 List of variables included in the unrestricted VAR: <i>lnrgdpc, lngfcf, lnpy, lnwedge, lnuc, lnopenk, lnint</i> List of deterministic and/or exogenous variables: const						
Order	LL	AIC	SBC	LR test	Adjusted LR test	
4	201.5880	96.5880	13.4533	-----	-----	
3	165.1949	85.1949	21.8542	CHSQ(25)= 72.7862[.000]	30.3276[.212]	
2	144.9372	89.9372	46.3904	CHSQ(50)= 13.3016[.000]	47.2090[.586]	
1	109.4238	79.4238	55.6710	CHSQ(75)= 184.3284[.000]	76.8035[.421]	
0	-75.0158	-80.0158	-83.9746	CHSQ(100)= 553.2077[.000]	230.5032[.000]	

AIC=Akaike Information Criterion SBC=Schwarz Bayesian Criterion

Table (37): Testing for lag order in a VAR – South Africa

Test Statistics and Choice Criteria for Selecting the Order of the VAR Model Based on 36 observations from 1969 to 2004. Order of VAR = 4 List of variables included in the unrestricted VAR: <i>lnrgdpc, lngfcf, lnpy, lnwedge, lnint, lnuc, lnopenk</i> List of deterministic and/or exogenous variables: const						
Order	LL	AIC	SBC	LR test	Adjusted LR test	
4	349.9980	143.9457	143.9457	-----	-----	
3	301.1125	139.8541	139.8541	CHSQ(25)= 97.7712[.000]	35.3063[.083]	
2	265.6568	200.6568	149.1925	CHSQ(50)= 168.6824[.000]	60.9131[.139]	
1	228.5826	188.5826	156.9123	CHSQ(75)= 242.8308[.000]	87.6889[.150]	
0	61.5606	46.5606	34.6842	CHSQ(100)= 576.8749[.000]	208.3159[.000]	

AIC=Akaike Information Criterion SBC=Schwarz Bayesian Criterion

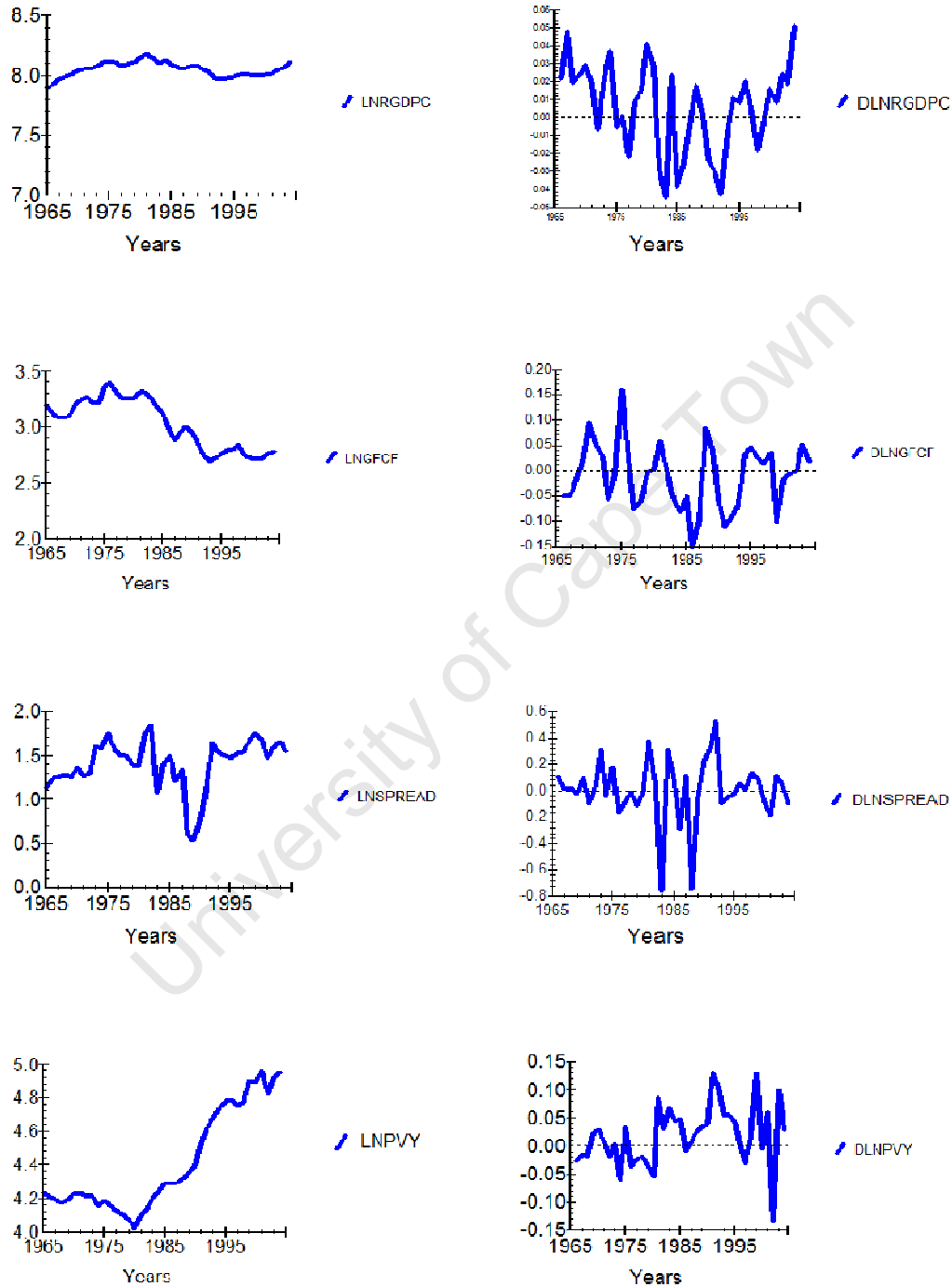
Table (38): Testing for lag order in a VAR – Zambia

Test Statistics and Choice Criteria for Selecting the Order of the VAR Model Based on 36 observations from 1969 to 2004. Order of VAR = 3 List of variables included in the unrestricted VAR: <i>lnrgdpc, lngfcf, lnpy, lnwedge, lnint, lnuc, lnopenk</i> List of deterministic and/or exogenous variables: const						
Order	LL	AIC	SBC	LR test	Adjusted LR test	
3	46.4035	-15.5965	-134.142	-----	-----	
4	15.0467	-59.9533	-120.363	CHSQ(25)= 62.7137[.000]	28.8144[.083]	
1	-17.6573	-67.6573	-107.930	CHSQ(50)= 128.1217[.000]	58.8667[.139]	
0	-153.669	-178.669	-198.806	CHSQ(75)= 400.1455[.000]	183.8506[.000]	

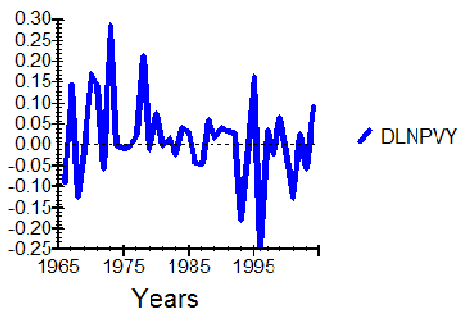
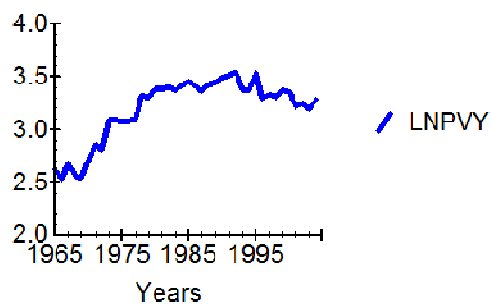
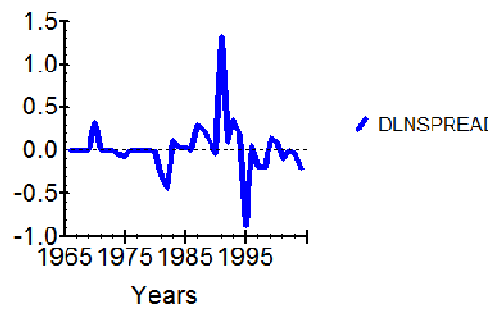
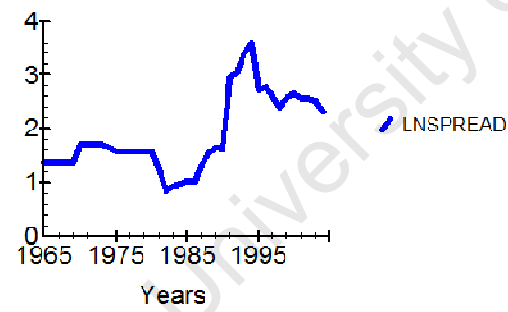
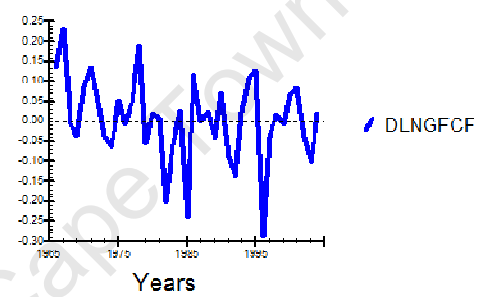
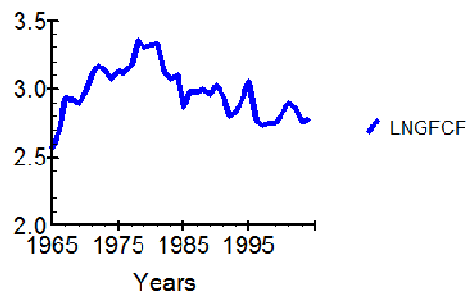
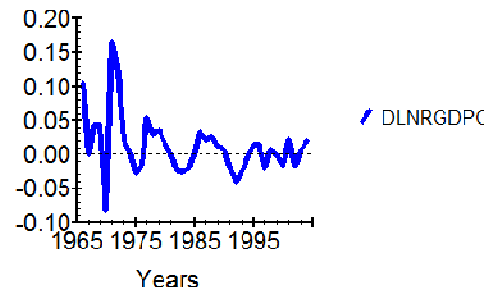
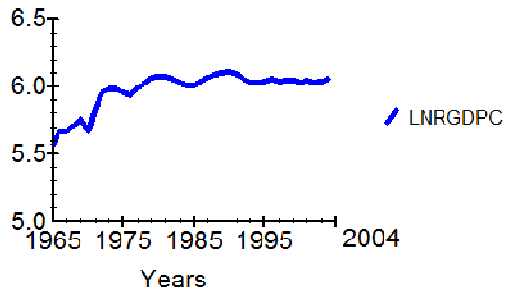
AIC=Akaike Information Criterion

Figure 34: Graphs on data in levels and first differences.

South Africa



Kenya



Zambia

